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HIGH TIMES

February 505

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ISSUE**

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**GREEN
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HIGH TIMES FEBRUARY



When it comes to greenhouses, growers have their choice of virtually any size structure they need as well as several different styles.

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Our (semi) annual roundup of the best pens on the market to help you choose the perfect vape. Whether you're budget-conscious or a big spender, there's a vape pen for you.

59 Daytime Highs

We take a closer look at the trend toward lower-THC cannabis, investigating the history, genetics and benefits of less potent pot. *By Reggie Dankers*

66 2018 Hydro Report

Hydroponics expert Erik Biksa reveals new and more sustainable ways to grow cannabis plants without soil quickly and cleanly. Bonus: Hot new hydro products plus 7 nutrient lines you should try!

80 Greenhouse Growing

Greenhouse growing can be the best of both worlds—a controlled indoor environment combined with the power of the Sun. Here are the basics you need to know. *By Nico Escondido*

94 Moms Who Get High

Mothers who use cannabis have found themselves on the front lines of a controversial movement of pot and parenting. Learn more about the benefits experienced by moms who medicate. *By Jessica Delfino*

101 The High Times Interview: Cat Cora

Celebrity chef Cat Cora is speaking out in favor of medical cannabis. Cora hopes to use her renown to help normalize the medicinal use of marijuana. *By Mike Gianakos*



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THE 10 BEST STRAINS FOR WORKING OUT

While some unenlightened people still cling to the old stereotype of the lazy stoner, the truth is that cannabis users are as active and engaged as any other group. In fact, certain types of marijuana can actually help you lead an active life—just as other strains can aid in rest and relaxation. For tokers looking to improve their workouts, the right strain can motivate you to get to the gym, provide energy for exercise and even help you concentrate on the task at hand.

With this in mind, *High Times* unveils the top 10 strains to improve your workout. Yes, these strains are all *sativa*-dominant. But each offers its own benefits for working out and getting active. So, before you head for the gym, check out our 10 Best Strains to Improve Your Workout! **Visit hightimes.com for more.**



ON INSTAGRAM

We spend a lot of time appreciating the beauty of the cannabis plant here at *High Times* but rarely do we get such a close look at the glorious trichomes that are responsible for producing the cannabinoids, terpenes and flavonoids that make each strain unique. While cultivation innovations over the years have helped make pot more potent, technological improvements in lenses and cameras have changed the game, leading to photos like this one by @erik.nugshots. We don't know if this mesmerizing, exquisitely grown Jelly Donut strain will end up as flowers or if the trichomes will be separated and turned into hash. Just remember, once those trichomes turn from clear to cloudy, it's about time to harvest!



SMOKING POLL



How Potent Do You Like Your Pot?

As Potent As Possible - 20+ Percent THC	70%
Mellow - Around 15 Percent THC	22%
Low - Around 10 Percent THC	5%
CBD Dominant	3%

It's no secret that cannabis is getting stronger. This is largely due to marijuana prohibition. Pot's illicit status has forced growers to cultivate smaller batches of more potent weed. The realities of growing an illegal crop, combined with cultivation innovations and new breeding techniques, have helped push pot toward its THC threshold. We now regularly see cannabis testing at over 20 percent THC.

While this potency trend suits some just fine, other tokers are seeking a more mellow high. This month, we explore the low-THC movement (page 59). And we decided to ask our readers, how potent do you like your pot?

A majority of readers responded that they like their pot as potent as possible. More mellow strains were preferred by 22 percent of respondents while just five percent of readers like low-THC strains best. CBD-dominant strains were favored by just three percent of readers.

Take our latest poll online!



We Want To Hear From You!

Tweet your best high observations and comments our way @HIGH_TIMES_Mag for a chance to be featured on this page! And be sure to follow us on Facebook (Facebook/HIGHTIMES-Mag) and Instagram (@hightimesmagazine) for all the latest news as it's happening!

@Check_RaiSingh: @HIGH_TIMES_Mag Flowers are grown, dried, cured, and then they're ready. How hard is it to let the people have the most natural form of a medicinal plant?

@Workshop_CoyoTe: @HIGH_TIMES_Mag at my first cooking session i miscalculated and was stoned for 18 hrs! slight panic before going to bed but quite the ride! #edibles

@michaeldrevnak: @HIGH_TIMES_Mag People tell me not to do drugs and I tell them I don't do drugs I smoke weed

@Herba77list: @HIGH_TIMES_Mag With me it's about the quality of the high not the quantity of THC

@TheDefRapper: @HIGH_TIMES_Mag SFV OG!!!! Best strain of all time.

@TerapinSedation: @HIGH_TIMES_Mag "Serve and Protect" has been replaced with "Arrest and Collect"

@mtn_pcfixer: @HIGH_TIMES_Mag So High Times is now another official democratic liberal media outlet...

@ChrisBeeler3: @HIGH_TIMES_Mag How lame, that they tried (and failed) to make pot out to be a "REAL Menace to our society crap!"

@maryholmngren10: @HIGH_TIMES_Mag I don't smoke.. don't judge people that do.. and I am fighting the good fight...

@ChefJoeette: @HIGH_TIMES_Mag I have wasting syndrome and cannabis definitely helps me. I can go days with no desire to eat but I want to eat after I smoke. I am grateful!

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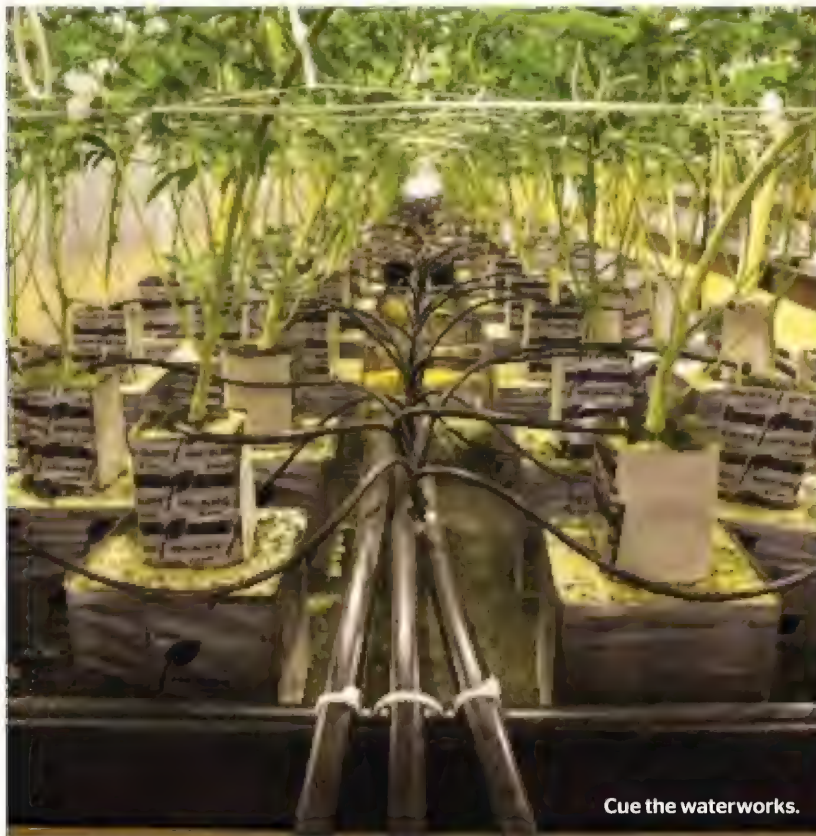
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ZEN AND THE ART OF HYDROPONIC POT GROWING

"Empty your mind, be formless. Shapeless, like water. If you put water into a cup, it becomes the cup. You put water into a bottle and it becomes the bottle. You put it in a teapot, it becomes the teapot. Now, water can flow or it can crash. Be water, my friend." —BRUCE LEE

Hydroponics is the art for growing plants without soil. But that raises the question: Why grow plants without soil?

The first reason is to create a clean and sterile environment. If you want your growroom to resemble a laboratory instead of an outhouse, you can't have buckets full of stinky dirt and worm poop lying around. Soil mixes tend to invite pests into your grow environment, which impede root access to oxygen, so removing soil from your growing environment keeps it more hygienic.

The second reason is that roots, and thus the plants above them, grow much faster when unencumbered by soil mix. When environmental controls, nutrient-solution temperature, PPM (parts per million of plant food) and pH (potential hydrogen, a measure of acidity or alkalinity) are kept within proper parameters, plants grown hydroponically exhibit absolutely explosive growth rates.

So if you're interested in growing cannabis cleanly and quickly, look no further than our yearly "Hydro Report" contained within this issue. In it, we break down the many different styles and systems for growing without soil as well as highlight hot new hydro products and nutrient lines.

Also in this issue, we've included a comprehensive primer on greenhouse ganja growing, our 2018 "Vape Pen Review" and a breakdown of low-THC strains and their history and uses, as well as a feature on moms who get high. So dig in, ditch the soil and remember: Water is life!

Danny Danko

Senior Cultivation Editor

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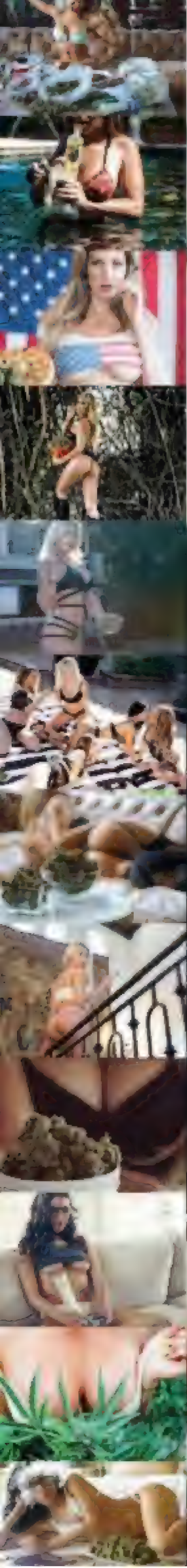
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PROUD PARENT

I've long thought about how my oldest sons earn a living. It began in my home, cloak and dagger fashion, while legislators were noodling on the legality of growing medical and personal use marijuana. I allowed my sons to grow and hone their skills. I didn't say a word to friends and family about it for a long time.

One day I thought, "Why not? Who cares?" I'm proud of my sons to be in on a trend and market that isn't yet glutted with growers. Not to mention all those imposter growers.

My sons have amazing skills and their "trees" are something to behold. I never thought a pot plant could grow so tall or be so robust!

*Sandy
California*

THE TRIPPING POINT

If two persons, similar by all outward appearances, each consume a tab of LSD, both cut from the same sheet, the experience will most likely be vastly different. Hallucinogens allow for an experience to be determined and driven by the uniqueness of your physiology and psychology. Each experience is guided and changed, sometimes in dramatic fashion by the choices you make in that moment. Most other mood or mind altering drugs will produce fairly identical levels of intoxication and impairment.

Hallucinogens will shatter your preconceptions, time after time. Shortly after you dose, you reach a moment. You realize there is no going back. It's similar to being at the first drop point of the tallest roller coaster you've ever seen. When you crest that peak, you excitedly look down, there is no track, there is no ground. Your stomach checks out and leaves a hollow space that fills with butterflies. Each person enters a reality that is created when their mind's eye blends with nature. It's almost as though the glasses we all unknowingly wear for our entire lives are removed. Now for the first time, we experience our world, the way we were intended to.

You'll experience in real time the symphony of our universe. Thoughts of controlling it have long faded. The strongest intellect is no match. Your flow accelerates. The physical world, the one we know so intimately, is twisting. Vibrations become visible. It almost reminds us of how being gently drawn past a black hole's event horizon might feel. At this event horizon, we find things



"WEED IS THE ONLY DRUG THAT CAN WIPE AWAY A LIFE BECAUSE IT IS ILLEGAL, NOT BECAUSE OF ITS CHEMICAL COMPOSITION."

familiar, memories from our world. All of it is different though, steadily drawing us closer to what we always know is the answer. Not the theory of everything, that would prove to be disappointing and simplistic, this however is brilliant.

Could it be our creator? Is she asking we follow? As if by some shred of our still-preconceived notion that we have any control, we consider resisting, hoping our last tie to humanity doesn't break. It's far too powerful, we cannot resist creation. Like our first kiss, we close our eyes... and fall. Our world is not even a memory. We are one with everything in all dimensions. In time, we emerge. We watch as the glasses that dull our world are put back on...

Leon

Whoa.

MARIJUANA MIRACLE

When I first moved back to Maine from attending university in Montreal, my brother was extremely sick. He was on a handful of medications that were causing a multitude of problems in his body.

He was falling into unresponsive states due to interactions that affected his

vital organs. He was also extremely malnourished due to constipation from the aforementioned medications. In that moment, I decided to take on full-time care of my brother. I took him off all the medications and got him a prescription for THC and CBD oils. He has experienced a transformation with the help of medical marijuana.

*Jessie
Maine*

NO-MAN'S LAND

I live in Long Island, New York. Here, weed is illegal. Technically it's decriminalized but I can still be arrested for cultivation. Sent to hard prison for a very long time. I use for reasons both medicinal and recreational, but the police don't care about the why. I have lived a hard life and worked hard jobs. Toiling in an industrial wasteland. I have pain that I must deal with. In their eyes, I am corrupting my community and destroying lives.

Alcohol has never agreed with me. I don't understand how someone can go to a bar and pay for something that tastes like shit and makes you feel like shit. I have seen alcohol destroy lives. I have watched as one of my best friends was changed by it. The addiction nearly killed him.

I have never seen a pothead make the same asinine decisions that someone on alcohol makes. I have never seen someone purely smoke weed and end up in a casket because of it. Weed is the only drug that can wipe away a life because it is illegal, not because of its chemical composition.

If this were a legal state I wouldn't risk ruining my life just because I want relief. The West Coast seems like the promised land. It seems like heaven to me. It feels like legalization will never happen here. This is no-man's land. As bright as sunny California is, the rays of liberation haven't even begun to touch us.

*Deadhead
Long Island, NY*

Correction: The cover and centerfold photos for our December 2017 issue were incorrectly credited. Both photos were taken by Emerald Mountain Media and the Purple Punch plants were grown by Eugreen Organics. We regret the error.



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**Contact
High**

GET A GRIP! Check out Brad McClain, whose board is currently sporting the new High Times X Graphic Mob grip tape. Here he is flying our colors on this half pipe set up in the midst of some healthy greenery somewhere on the Left Coast. Thanks, Skummy and XYZ friends. *Photo by Cecilia Gonzalez (@cecisurfskate)*



**Contact
High**

GREENHOUSE GROWING This Colorado greenhouse deploys supplemental lighting, amended-soil earth-beds, and light deprivation techniques. For more on greenhouse cultivation check out Nico's grow feature starting on page 80. *Photo by Nico Escondido*





February 2018 **High Times**

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LIVING THE HYDRO LIFE Pot plants grown without soil display massive growth rates and quickly develop into huge bud-laden bushes. For high-yielding hydroponic growing tips and tricks, check out our 2018 Hydro Report on page 66. *Photo by Erik Biksa*

**Contact
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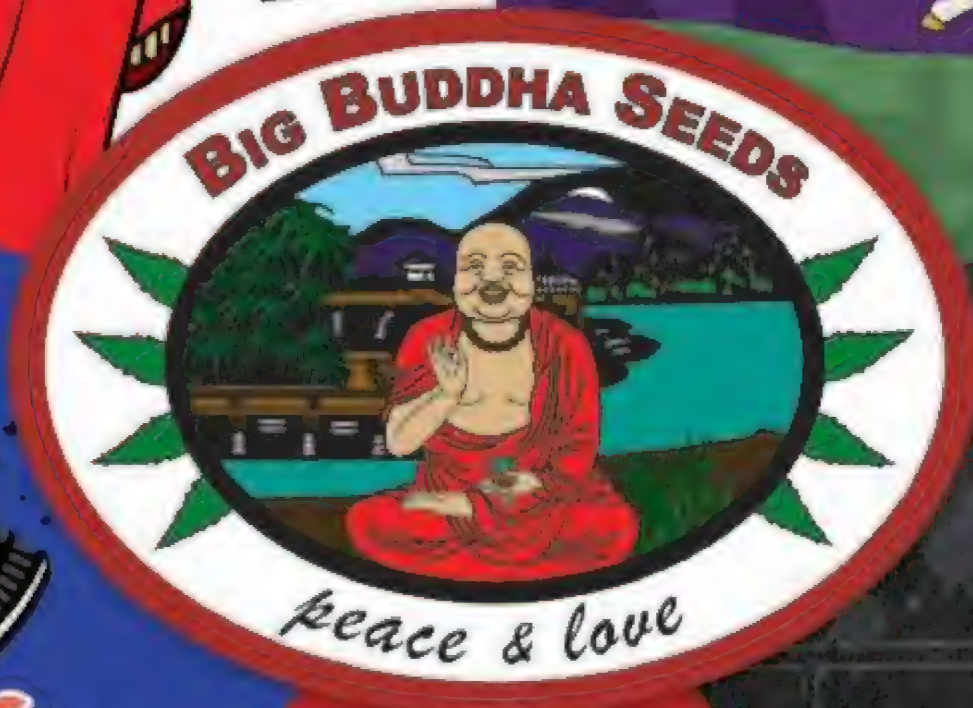


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ENTERTAINMENT

CHRONIXX

Jamaican reggae artist Chronixx talks with *High Times* about cannabis and creation. p.32



High Times handed out awards for the best pot products in the Northeast!



PATRIOT POT PARTY

HIGH TIMES MADE HISTORY WITH THE 2017 NEW ENGLAND CANNABIS CUP—OUR FIRST MARIJUANA COMPETITION HELD IN THE NEWLY LEGAL NORTHEAST. BY AB HANNA

The New England Cannabis Cup in Wakefield, RI, almost didn't take place. Fortunately, theFarmacist stepped up to the plate, partnering with High Times to make it happen. The event faced opposition, but theFarmacist was instrumental in putting it on successfully, fielding calls from the state, booking the venue and entertainment, and working with High Times staff to make sure the show went on.

One of the highlights of the weekend was the all-you-can-dab buffet, set up by Beta Glass Labs. The company also had every model of its line of flawlessly

functioning German-engineered water pipes for guests to try.

Blazer, makers of excellent torches for dabbing, provided a ton of free tools for guests that preferred to heat their own.

Concentrates were abundant, but the star of the night was definitely the flower, as joints were the preferred method of consumption.

If anyone wanted to give their lungs a break, though, guests could turn their weed into oil with a pneumatic rosin press that EZ Squeeze provided, along with plenty of munchies. Free food was

constantly brought out, ensuring that there was always something fresh to snack on.

There were several booths set up for cultivation, where growers looking for supplies could find vendors such as Aurora, Solis Tek and the East Coast Hydroponic Warehouse.

For those more interested in partaking, there were plenty of free cannabis products as well as a smoke shop with a wide variety of grinders, papers, pipes and nails for concentrates too. Anything you might have left at home could be found at the event.

You could even hang out with a seasoned glass artist. Long Island Glass showcased some of its innovative, functional glass art and answered questions from Cup-goers.

Every part of the cannabis community was involved: growers, glassblowers, smokers, dabbers—you name it. It was a great place to network with people in the industry. The venue wasn't overcrowded, and the music was loud enough for attendees to vibe to but not so loud that they had to shout to have a conversation.

The TetraHydro Club provided an experience that was different from the typical club scene. There wasn't a single person passed out, sick or belligerent. That's the beauty of having no alcohol present at an event. Not to mention that theFarmacist had Big Dawg Security on the job to make sure everyone was safe.

The music started with a couple of New England rappers spitting cannabis-inspired bars for a stoned audience. Cup-goers couldn't help but bop their heads to the boom-bap beats and sharp lyrics. Not many artists know how to get a crowd of people who have been getting high all day pumped, but Redman sure does. When he took the stage, Red had the crowd jumping to some of his classics. In between songs, he talked cannabis and emphasized the importance of voting. *High Times* senior cultivation editor Danny Danko reiterated this point during the

« Cup awards ceremony, encouraging young cannabis enthusiasts to turn out at the polls and to run for office.

After the show, a meet-and-greet with the hip-hop legend commenced. Redman dapped everyone in the room, talked more cannabis and let guests share some of New England's finest with him before leaving.

Then, during the awards ceremony, free merch was flying—literally. T-shirts, hats, vape-pen cartridges, edibles and more were tossed from the stage to guests during the show. Tons of other gear was raffled off. Anyone who bought raffle tickets most likely won a thing or two.

The Cup awards show kicked off with Best Topical announced by Eve of High Beautiful, a cannabis-focused event and marketing management agency. She presented the first-place award to Budsuds for its Buzz Balm Infused Salve. The award for Best Edible went to the powerful Milk Chocolate Pumpkin Spice Punch Bar by Ocean State Collective. Second place went to Zen Labs, for its edibles made in New England.

High Times competition coordinator Sean Black announced the concentrate winners. Black presented Paul's Boutique Nursery in collaboration with Team Green with the award for Best

CONCENTRATES WERE ABUNDANT, BUT THE STAR OF THE NIGHT WAS DEFINITELY THE FLOWER, AS JOINTS WERE THE PREFERRED METHOD OF CONSUMPTION.

Medical Concentrate for Agent Orange. Black then took the time to explain how any unwanted residuals in flowers become concentrated alongside cannabinoids during an extraction—safety first.

The award for Best Medical Flowers at the New England Cannabis Cup went to High Standard, a company run by a young couple who grow some of the best legal buds in the Northeast. After Danko presented them with the award for their Gorilla Glue #4, he spoke about the importance of growing your own weed. He also gave a shout-out to mom-and-pop growers, pointing out that the quality of cannabis decreases when quantity becomes the focus.

The New England Cannabis Cup awards ceremony and VIP party were the first of their kind. It wasn't your typical Cannabis Cup—it was a much more intimate event, where every single guest got the VIP treatment. ✨

BEST MEDICAL FLOWERS

1st Place: Gorilla Glue #4

by High Standard with Miss Laura

2nd Place: Purple Punch by Paul's Boutique Nursery

3rd Place: Mack by Grow_ill_o

BEST MEDICAL CONCENTRATES

1st Place: Agent Orange by Paul's Boutique Nursery in collaboration with Team Green

2nd Place: Strawberry OG Snap & Pull by High Standard in collaboration with Something Better Concentrates

3rd Place: Golden Unicorn Pull n Snap by Baystate Concentrate

BEST EDIBLES

1st Place: Milk Chocolate Pumpkin Spice Punch Bar by Ocean State Collective

2nd Place: Cookies and Creme Peanutbutter Cups by Zenn Labs

3rd Place: Blue Razz Funk Juice by SKB

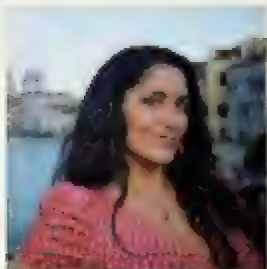
BEST TOPICALS

1st Place: Budsuds Buzz Balm Infused Salve by Budsuds

HIGH FIVE

SHATTERING THE GRASS CEILING

HERE ARE FIVE WOMEN MAKING WAVES IN THE WEED WORLD. BY MARK MILLER



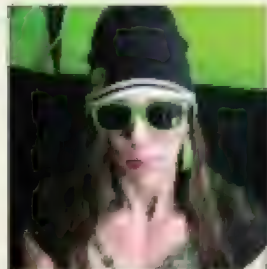
YVONNE DELAROSA GREEN

The aptly named Ms. Green holds the historic distinction of being the first licensed cannabis proprietor in Los Angeles County, as the Golden State prepares for recreational sales beginning in 2018. Green operates the all-female-staff 99 High Tide Collective in Malibu, which she was inspired to open after taking her breast-cancer-stricken mother to local LA dispensaries and finding them lacking. Green opened 99 High Tide Collective in 2015.



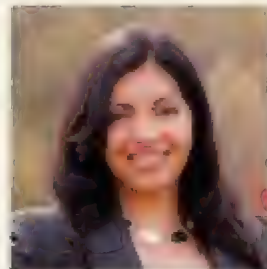
PATRICIA SMITH

Shaking an early aversion to cannabis (thanks to pervasive Reefer Madness-like propaganda), Smith first became aware of pot's medical properties during the HIV/AIDS epidemic in the 1980s, when she would bake brownies for people suffering from the disease. Today, she lives in Yuba County, CA, where she hosts the Cannabis Crusades radio show on KVMR. Smith's latest endeavor, CannaCompounds, produces personalized CBD-based tinctures and other products for medical-pot patients.



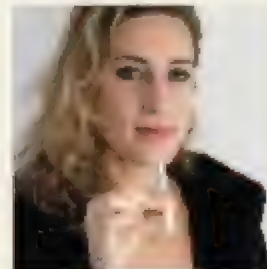
MZJILL

The co-founder and head grower/breeder at TGA Genetics, MzJill is renowned for creating Jillybean, a particularly effective strain for treating PTSD, anxiety and depression. MzJill also helped develop TGA's Agent Orange in honor of her father, a Vietnam veteran who died from cancer likely caused by the deadly chemical-warfare agent of the same name. MzJill is currently rebuilding after the devastating wildfires that swept through Northern California damaged her home and cultivation center.



SHALEEN TITLE

Title is an Indian-American attorney who co-founded THC Staffing Group, a cannabis-company recruitment firm with locations in San Francisco and Boston. Title prioritizes activism and strives for greater diversity—her primary goal is fostering economic empowerment in the legal industry for people of color. Title's passion for pot politics was sparked as an undergrad at the University of Illinois when she joined the local chapter of Students for a Sensible Drug Policy.



JESSICA ASSAF

Assaf is the CEO and head of products at Cannabis Feminist, a Los Angeles-based women-for-weed organization. Cannabis Feminist was founded in November 2016 with the goal of establishing a female marijuana-networking empire that connects with "cannabis consultants." Assaf believes that empowering women to lead the cannabis industry—the organization's motto is "the future of cannabis is female"—will help "transform the plant into a universal wellness product."

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Harvest hell

WILDFIRES DESTROY CALI CROPS

The wildfires that ripped through California in October devastated the state's cannabis crop, destroying or seriously damaging dozens of pot farms. Hezekiah Allen, executive director of the California Growers Association (CGA), told the *San Francisco Chronicle* that fires in Sonoma and Mendocino counties caused "the worst year on record for California's growers." Besides the immediate destruction of their product, weed growers face unique challenges in the wake of disasters like this one. A depletion of supply at this moment—during the fall harvest and just a few months before California's enormous recreational market is set to take off—is a cruel blow to the nascent industry. Because marijuana is still illegal at the federal level, it is nearly impossible for pot farmers to insure their crops (unlike wineries, which were also scorched in the Napa and Sonoma fires). As if that weren't enough, weed farmers are not eligible to receive federal recovery support, such as FEMA relief. "I had one conversation today where the family was in tears, saying, 'We don't know how we're going to make it to January, let alone next planting season,'" said Allen.

A number of farms launched online crowd-funding appeals for disaster relief, but at least one website, *youcaring.com*, put the kibosh on funding to support marijuana causes. YouCaring refused to allocate the more than \$13,000 in donations the CGA raised for families hit hard by the fires. A YouCaring spokesman told the *Canifornian* that his company "supports all forms of treatment and most fundraiser types," but that the company's payment providers, WePay and PayPal, "do not allow fundraisers for anything marijuana-related, including for medical reasons" due to federal law. WePay says it will disburse payments to support growers' families, but not for damaged crops. The CGA has since launched a funding drive on its own website, at emeraldgrowers.nation-builder.com/wildfire.

CHEEBA
LAS VEGAS

Just a few months into legalization, Nevada is swimming in weed revenue. The state's Department of Taxation reported that ganja sales in the first month alone generated more than \$3.6 million in taxes. About a million of that is earmarked for schools around the state, with the remaining \$2.5 million put into a rainy-day fund. State officials revised upward their earlier estimates of future revenue, declaring that the weed biz will bring nearly \$120 million in taxes over the next two years. It should come as no surprise, then, that the state is facing a pot shortage. Dispensaries are "essentially waiting for marijuana plants to grow, so they can restock their shelves," according to NBC affiliate News 4. Dodgy distribution, since only a few liquor distributors are allowed to sell the goods for the first 18 months of the state's rec-legal program, has stymied supply since day one.

INSIDE
THE WIDE
WORLD OF
WEEDBusted on
the bayou

A LOST BOY

You may remember Corey Feldman from such films as *Gremlins*, *The Goonies* and *Stand by Me*. The former child star, now 46, had a rough night in Mangham, LA, recently when he and his band—Corey Feldman & the Angels—were stopped for speeding. Upon learning that Feldman's license was suspended, the cops brought him in; upon smelling something dank, they searched his RV. Some prescription weed and other "controlled dangerous substances" turned up. Feldman and his bodyguard were able to pay their misdemeanor fines, while four other band members, including Feldman's wife, Courtney Anne Mitchell, were booked on various drug charges (in her case, for Xanax). It all sounds rather tame compared with the time in 1990 when Feldman was stopped for a traffic violation in North Hollywood, then arrested for the 25 balloons of heroin and cocaine in his car.

SCIENTISTS FEED WEED TO FISH

Scientists in Lebanon, with apparently nothing better to do, tried dosing Nile tilapia raised in tanks with cannabis-oil-infused food pellets. They'd hoped that a little herb juice every day would mellow out the fish, who live



Reef-er fish

a stressful existence in tight quarters, according to *Hakai Magazine*. There was no real change after two weeks, although the researchers did say that the dosed fish got a "metabolism boost" (i.e., the munchies), "but they were not given extra food to make up for this metabolic increase," according to Patrick Saoud, an aquatic scientist at the American University of Beirut and lead author of the study. "So they used what food they got for energy rather than building blocks for growth." Saoud was able to score the cannabis from a local police evidence locker, but the scientists won't be using it again anytime soon. "Until further research yields different results," the study sadly concludes, "we do not believe fish should be given reefer."



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AMAZON PRIMO

Orlando, FL, was the happiest place on earth, briefly, when a couple found 65 pounds of weed in their Amazon order. Well, it *would* have been happy if the couple were more into it, but in fact the massive stash spooked them, so they called the cops. They told ABC affiliate WFTV they didn't want their names made public, and they did not sleep at home for a few days after the big score. When their Amazon order—four 27-gallon plastic containers—arrived, they knew something was off when it weighed over 90 pounds. “They were extremely heavy, heavier than you would think from ordering four empty bins,” the woman told WFTV. The dank delivery came via UPS from a facility in Massachusetts, but police have made no arrests as yet. Amazon is working with authorities to investigate; meanwhile, the company has sent the couple a \$150 gift card for their trouble. No trouble at all, we say!

A PR NIGHTMARE

Hurricane Maria wreaked havoc on Puerto Rico, and among the casualties was the US territory's fledgling medical-marijuana industry. The Puerto Rico Medical Cannabis Association is assessing damage so that companies can begin receiving payments from insurers. Because marijuana is illegal at the federal level, though, they won't be receiving any aid from the US government. This hurts, not least because the medical-pot business was one of the few sectors of the island's economy on the rise before the storm hit. “Big manufacturing and grow facilities have had their roof blown off, there is water in their manufacturing rooms, equipment damaged, no light for plants and most are dead,” Goodwin Aldarondo, the president and CEO of Puerto Rico Legal Marijuana, told NBC News. “You're talking about millions of dollars of damage and we just started as an industry.” Puerto Rico legalized medical pot last December, partly to pump up economic activity on the island, which faces about \$74 billion in crushing debt.

BIG GOV'T POT JOBS



With the impending blossoming of the California market comes an attendant growth in bureaucracy—and that's the good news. The fully legal Golden State will create hundreds of government jobs—for tax collectors, scientists, analysts and many others. At the beginning of last year, there were just 11 full-time workers in the state's Bureau of Cannabis Control regulatory agency. Today, there's more than twice that amount, and the bureau figures there will be more than 100 staffers once the new law kicks in. The agency is about to move into new offices to accommodate the new positions, and there will be satellite offices elsewhere around the state. The bad news, if there is any, might be that more government engagement in the industry will create bureaucratic obstacles to legal operations, thereby creating incentives to remain in the black market.



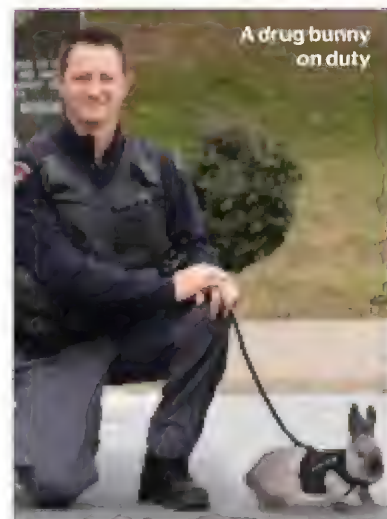
A friend in weed

GOODBYE, HEF

Whatever else you might think of Hugh Hefner, the man was always a friend of the kind. Right around the time Richard Nixon was ramping up the War on Drugs in earnest, Hefner's Playboy Foundation stepped up with \$5,000 in seed money for the National Organization for the Reform of Marijuana Laws, and it remained NORML's primary funder throughout the 1970s. Moreover, *Playboy* magazine taught millions of readers that weed was okay at a time when pot smokers were being demonized just about everywhere else. We at *High Times* have a special fondness for *Playboy*, of course, since our rag was originally intended as a spoof of Hefner's magazine. Our inaugural issue in 1974 featured a young woman holding a psychedelic shroom to her lips in an erotic but tasteful pose, and we've kept the tradition alive with monthly centerfolds of gorgeous “ladies.” Rest in peace, Hef, warts and all.

DRUG-SNIFFING BUNNIES

Phoenixville, PA, mayoral candidate Dave Gautreau surprised attendees at a recent public forum when he announced he would look into deploying drug-sniffing rabbits for the borough's police department. Gautreau might have checked out his info with a bit more skepticism, because it turns out he fell for a (very obvious) hoax. In March 2016, the sometimes-satirical website *peopleoflancaster.com* reported that Lancaster City Police had purchased four narc bunnies because they were cheaper than dogs and because “drug sniffing rabbits have been used for years in Australia where the fully trained Drug Rabbits will come from.” Gautreau claims he called Lancaster to confirm this intriguing news (he couldn't recall if he phoned the police department or the city offices) and that an unnamed woman told him that yes, they were using Australian rabbits to sniff out drugs. They were not.



A drug bunny on duty

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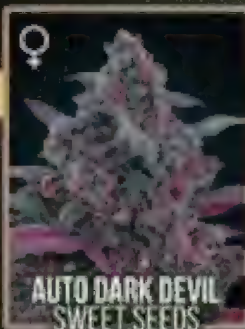
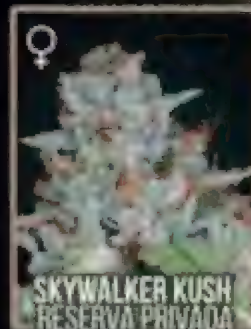
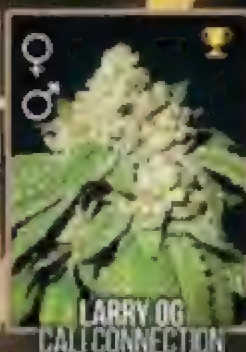
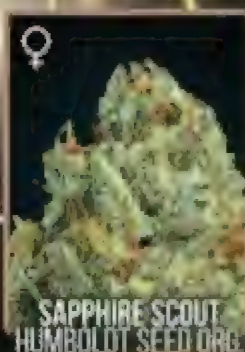
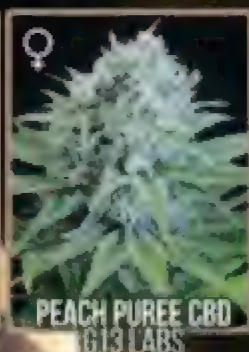
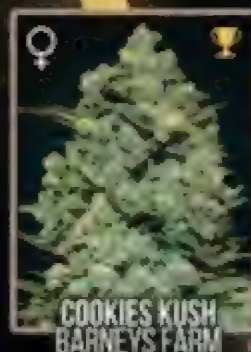
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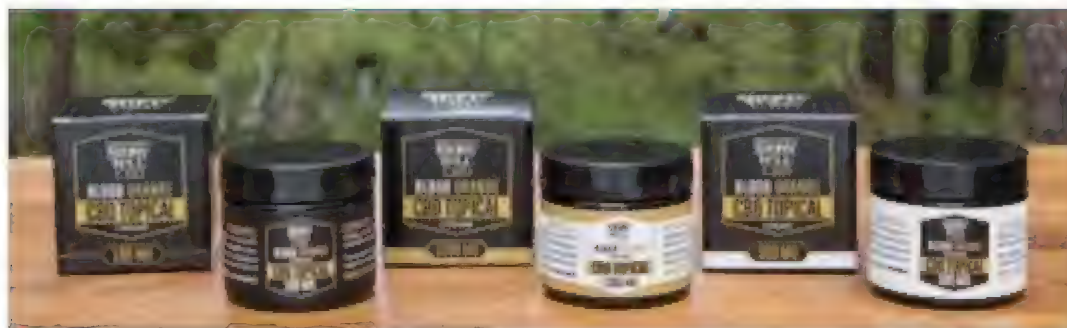
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SPOTLIGHT

MORE MARIJUANA MOVES FOR MARLEY

Damian Marley's cannabis company Stony Hill has joined the ranks of CBD purveyors with a line of organic, hemp-derived cannabidiol gummies, topicals and tinctures. Stony Hill CBD products are designed to target a wide array of conditions. CBD gummies are available in both daytime and nighttime formulations, with melatonin added to the nighttime version to promote healthy sleep. All-natural CBD topical lotions, scented with blood-orange essential oil, absorb deeply into skin and joints to treat pain and inflammation. And full-spectrum, hemp-derived CBD tinctures are available in a wide range of strengths.

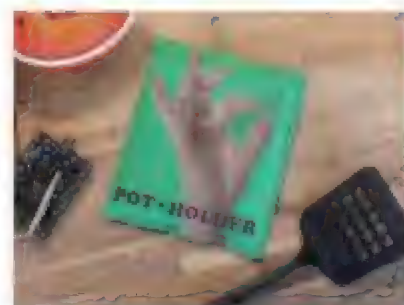
Hemp-derived CBD is a viable alternative for people who want to reap the medical benefits of cannabis but are unable to obtain it legally, or for those who do not want any psychoactive effect from THC. For more on Stony Hill's line of CBD products, visit stonyhillCBD.com.



SMOKIN' STYLE

Celeb stylist Jacqueline Rezak loves adorning people with pot leaves. Her accessories line Rad + Refined pops up on tastemakers all over the world—last summer, Paris Hilton was spotted rocking a pair of Rezak's weed-leaf sunglasses at hipster central, a.k.a. Coachella.

Now you can score a badass StonerQueen OG Hoodie from Rad + Refined to really nail the couchlock comfort look. The cozy cotton pullover is perfection paired with skinny jeans, snuggling with a stoner buddy for a Netflix and-bong night, Sunday dinner with the family... Wear it anywhere, wear it all the time. Represent, queen. \$64, radandrefined.com



HOLD YOUR POT

This original pot-holder design was created by Patricia Foxx back in the 1970s when she was working as a fabric artist. Foxx brought the pot holder back into production to affirm her support for cannabis legalization, and her advocacy for senior smoking. The hand-sewn, screen-printed pot holder features an image of Foxx's own hand holding a joint. The clever double entendre is combined with handcrafted love to add a little lift to your kitchen. It's a great gift for the cannabis-loving cook in your life. \$15, etsy.com/shop/foxxdendesign



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HE KNOWS LOVE

RIISING REGGAE STAR CHRONIXX MUSES ABOUT CREATION, CANNABIS AND CONNECTEDNESS. BY MARY JANE GIBSON

You have a couple of collaborations on your latest album, *Chronology*.

I have a track with Joey Badass. The other collab is with my father, who is Chronicle.

How is it working with your father?

Cool. You know, I mean, he was the first musician I ever worked with as a child growing up. It's nice to know that we can still roll a vibe, you know? He's a cool individual.

You started singing in church when you were very young.

Yeah, and before that. Church was where we got introduced to musical instruments and singing in a choir and harmonizing, but ever since, from growing up in the

house, my whole family, we like to sing and dance and be creative.

How does cannabis fit into art and creativity and expanding your mind?

Cannabis is nature. It's creation. Man didn't create cannabis. But cannabis helps in the creation of man and helps in the creation of man's consciousness. It affects our evolution as artists and as mechanics and as scientists. Some of the greatest artists and musicians in the world have explored this plant, and it's a great thing.

How does it fit into your practice?

I don't really practice smoking. I use a steam chalice, which is a traditional

Jamaican thing. It's a bamboo chalice and a clay top, which we call a *kutchie*. That's like an oven that we cook the herb in and filter it through water.

Do you incorporate cannabis into your yoga practice?

Yeah, it's a nice thing. And herb and yoga work well together. It's like, it's amazing, because to really access certain parts of your mind you need to relax and to let go of certain cares that come with this dense human life experience sometimes. You need to

"CANNABIS HELPS IN THE CREATION OF MAN AND HELPS IN THE CREATION OF MAN'S CONSCIOUSNESS. IT AFFECTS OUR EVOLUTION AS ARTISTS."

let go of that. As we, as Rasta would say sometimes, you want to have some heaven on earth, and herb helps us to achieve that, and yoga, and being healthy. Because your body carries your spirit and your soul, your essence, so you have to make sure that body is always good enough and clean enough to carry around such a purity, such as a human soul or essence, you know what I mean? So yoga helps us to keep our body in line and helps us to keep the right flow of energy all the time.

Can you tell us about the "whole plant" concept?

Well, we, as Rasta, we are always trying to walk and live in unison with creation. This plant is a very important piece in the whole artwork of creation, you know? We cannot survive without trees and plants. I mean, trees can survive without us, but we can't survive without them. This one tree, cannabis, this one plant, I don't understand what's the thing about it. Because it's a good plant. I can never truly understand, except there's only one reason I see why this plant is still going through a lot of oppression on the earth. It's probably because it's an eye-opening thing and it's more convenient for your eyes to be closed in society, for society. ✨



LIFE IS LIKE...

"As far as the future is concerned, we don't know enough to hope [for] anything. Life is like a Netflix, you know? It's just one episode after the next, and I'm just excited to have been given the opportunity to experience life right now."



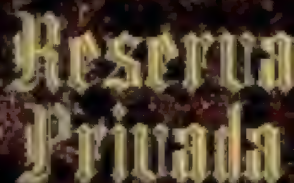
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King Krule
lights up in
Los Angeles.



"WE DROVE [TO JOSHUA TREE] AFTER A GIG AND WATCHED THE SUNRISE, AND THAT WAS PRETTY CHEESY."

with the bleeding heart of a true punk. Things are often deemed "cheesy," as in the flyer for a cannabis company that attracts his scorn. And almost in the same breath, he marveled at the building the *High Times* offices are housed in: "There's a period of architecture which is so astonishing in style, so in-your-face. I really enjoy Art Deco."

King Krule's latest album, *The Ooz*, sits perfectly in that swing between scorn and heartache. The title is self-explanatory, Marshall said: "Every day we're creating all of these disgusting, gunky substances from us. We're shaving, we're cutting our hair, trimming our nails, we've got snot, we've got all that slime inside of us."

Does weed figure into his making music at all? It did when he was younger, Marshall said. "I used to smoke a lot and just stay up all night and make beats and chill." Marshall still enjoys weed when he visits California, he said: "It's the benefit of it being legal. It's better stuff. It's clearer."

As our interview drew to a close, Marshall unfolded his lanky frame, standing and bending to scratch the office dog behind his ears. "What's his name?" he inquired. We told him. A huge smile stretched across his face. "Archie," he chuckled. "Nice." ✨

A RELUCTANT KING

ARCHY MARSHALL IS UNENTHUSIASTIC ABOUT FAME—BUT HE ENJOYS GOOD GANJA ON OCCASION. BY MARY JANE GIBSON

Archy Marshall released *6 Feet Beneath the Moon* under the moniker King Krule in 2013, when he was 19 years old. His aching, deep, guttural vocals over a richly layered soundscape garnered an immediate cult following. Kanye West invited him to collaborate. Marshall respectfully declined.

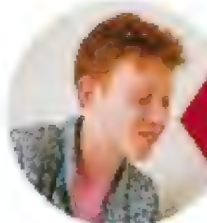
Since then, Marshall has been careful to duck the "voice of a generation" title bestowed on him by several music journalists, instead creating personal projects like *A New Place 2 Drown*, an album largely inspired—provoked, really—by the rapid gentrification of his hometown of London. During a

languid interview one July afternoon in Los Angeles, Marshall told *High Times* of his disgust with the city being sold off to developers. "The bringing down of housing, the bringing up of rent... all of these new builds that no one could afford to live in anyway. It's insane what's going on there"—like the Grenfell Tower fire, which killed an estimated 80 low-income Londoners a month earlier. "Shit needs to change."

Though at the time under the weather and somewhat melancholy, Marshall reminisced about the good times he's had on previous visits to LA. "These friends once drove me to Joshua Tree. That was

cool. I was getting pretty high then. We drove after a gig and watched the sunrise, and that was pretty cheesy. I liked it."

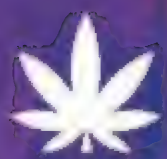
This is where Marshall strikes a delicate balance—being in touch with his emotions and baring himself for the world ("I'm a narcissist," he proclaimed), yet able to detach himself enough to comment on it, all through the lens of a snarky young man



DO NOT LABEL

Marshall has released music under several names: King Krule, Zoo Kid, Edgar the Breathtaker. "I like the theater of it," he declared. Are there names he hasn't used yet? "I've got loads," he laughed. "I've got crazy ones, man."

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It's a Man's World?

Jackie Shane begs to differ.

"Sticks and stones may break my bones / but talk don't bother me!" Thus spake the mighty Jackie Shane on the opening track of *Any Other Way*, a compilation of the masterful R&B singer's sensational soul-shouters and sin-stompers. Pretty much unknown outside of Toronto, where her star shone bright for a short while in the 1960s,



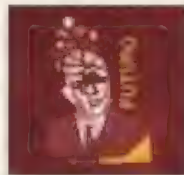
Jackie Shane
Any Other Way
(Numero Group)

Shane had to have had some extra inner goods to musically convey what it takes to survive with such hale and hearty authority. How so? Because she proclaimed loud and proud as a groundbreaker of transgender rights at a time when such a thing, well, it just wasn't done.

As detailed in the fascinating liner notes written by Shane herself, her tale is one of brazenly defiant openness

and pride in her identity and sexuality--she wore makeup, silk shirts and jewelry onstage and off, emphasizing a cultivated femininity of high-class decorum rather than putting on some kind of freak show to cater to a mainstream audience. That she was by all accounts a riveting live performer is manifest in *Any Other Way*, the first artist-approved anthology of her works. Pulling together all six of her 45s and several choice bits from the cultist-heralded 1967 live sessions at the Sapphire Tavern, the set's utterly burning tracks like "In My Tenement," "I've Really Got the Blues," "Send Me Some Lovin'" and a righteously commanding "Money (That's What I Want)" will grab you by the lapels and shake your complacent bootay. Jackie Shane = pride. *John Payne*

MUSIC RECOMMENDATIONS



Futuro
A Torre da Derrota
(Outprint)

➤ The latest from the chill-inducing female-fronted political post-punk band from São Paulo, this album includes standouts like the title track, with its chiming, dark guitars and overdriven vox that cut thrillingly through the jangle, and the amazing "O Outro Lado da Moeda," featuring an urgent

and complex bass line that elevates the emotion of the song to pure ascendancy in under 30 seconds. The bass is similarly advanced in "Réptil." I feel like the members of this band organically figured out a way to work together without sacrificing their individual creativity. What's better than that? *Polly Watson*



Sore Points
Don't Want To
(Hosehead)

➤ Vancouver, BC, trio Sore Points entertainingly describe themselves as their hometown's "fastest band on six legs," and while it's inarguable that fellow BCers Terrifier have them thrashed in regard to speed, that band has 10 legs, so I guess the point is moot. This is simple Killed by Death-style

punk with a heavy Ramones influence on the vocals. Wrathful guitar and a super-tight rhythm battery power brief ragers "Don't Want To," "Still Standing" and "Be Alone," plus a killer cover of "Algomania" by under-known French '80s punk-wavers Dogs. I would love to see this band live. *Polly Watson*



Grave Pleasures
Motherblood
(Century Media)

➤ Finnish death rockers Grave Pleasures began their career under the name Beastmilk, unleashing 2013's brilliantly catchy *Climax* to critical acclaim. Their second album as Grave Pleasures is every bit as infectious as their original incarnation. The band balances post-punk pandemonium with

killer pop hooks and nuclear metaphors on sharp cuts like "Falling for an Atom Bomb" and "Doomsday Rainbows," while Mat McNerney's sonorous vocal lines invoke mushroom clouds over stinging guitars and apocalyptic beats. Make room on your best-of 2017 list for Motherblood. *J. Bennett*



Dead Lord
In Ignorance We Trust
(Century Media)

➤ Are Dead Lord the new Thin Lizzy? Truth is, these Swedes are probably about as close as we're gonna get to the late, great Irish rockers who stole America's heart in '76 with their unstoppable *Jailbreak* album. Led by heartily mustached vocalist-guitarist Hakim Krim, Dead Lord are apt pupils of Lizzy's

cool romantic form. As with their first two records, twin-guitar harmonies and classic-rock grooves prevail on cuts like "Too Late" and "Reruns," while mellow ballads "Part of Me" and "Leave Me Be" provide a quiet foil for hook-charged anthems like "Kill Them All" and "Never Die." *J. Bennett*

GAME RECOMMENDATIONS



Splatoon 2
Nintendo Switch
(Nintendo)

➤ Nintendo has rolled out the most fun multiplayer shooter of this generation. A synthesis of '90s commercial kid culture, *Splatoon* is the popsicle break between a round of Tony Hawk and Goldeneye via paintball mode. Ditching toxicity and kill-death ratios in favor of the insanely satisfying yet

simple goal of covering the arena in your team's color of paint, *Splatoon 2* rebrands the genre while still allowing you to waste rival squid-kids with guns and other paint-hurling devices. Active online events and updates keep things fresh—tentacles crossed for a *sativa*-versus-*indica* splatfest. *Tyler Merfeld*

Brand-new HD transfer of classic punk rockumentary,
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A HIGH TIMES FILM



A RIGHT OF PASSAGE

MVD

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BONUS MATERIALS:

High Definition Blu-ray (1080p) and Standard Definition DVD presentation of the main feature

Original 2.0 Mono Audio (Uncompressed PCM on the Blu-ray)

12 page booklet with liner notes written by John Holmstrom, founding editor of PUNK Magazine

"Dead On Arrival: The Punk Documentary That Almost Never Was" - A feature length documentary about the making of "D.O.A. A Rite of Passage" produced by award-winning filmmaker (and former MTV Senior Producer) Richard Schenkman (HD)

Reversible artwork | 2-Sided Poster Included | Original Theatrical Trailer

Limited Edition Retro 'Video Store Style' Slipcover / O-Card (First Pressing Only) | Rare Sex Pistols photo gallery

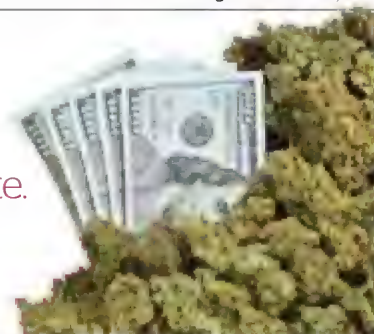
NOW AVAILABLE AT **MVDSHOP.com**

MVDvisual

Cannabis Is for Lovers

Marijuana is increasingly capturing hearts as a Valentine's Day favorite.

J.J. McCoy is Senior Managing Editor for New Frontier Data



CANNABIS SATIVA ENJOYS well-storied, even legendary, associations as an aphrodisiac. Ascribed as capable of providing various sexual effects (both positive and negative), it is mentioned in *One Thousand and One Nights* and references are made to it in the practice of Tantra and in Ayurvedic medicine (think *Kama Sutra* meets *Gray's Anatomy*).

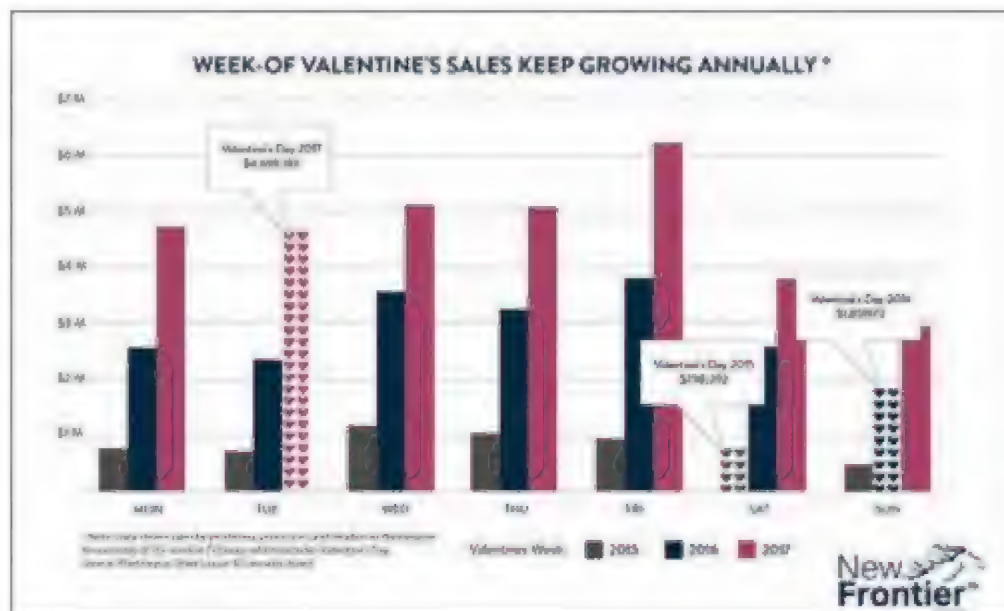
Much scientific research is still required for a more complete understanding of cannabis's effects on biology and sexual health. Unfortunately, pending reform of its federal classification as a Schedule I drug, much of what can be known for certain remains in the shadow of desire and seduction. In previous generations, those blinded by romance would have been better off educated about how Spanish fly (derived from the wings of blister beetles) could provide extended erections, but only unpleasantly numb ones (and thus pretty much self-defeating), with added noisome side effects like skin and throat irritation, vomiting and even death. All of which can really kill a mood.

Happily, more is already known and to be embraced about cannabis. Yet it remains incumbent upon today's romantics to realize going in that—since biological chemistry and sex are more than simple physiological processes—the introduction of cannabis may affect either or both partners' psychological and social experiences of sex in unpredictable ways.

That said, the cannabis industry is definitely looking to market a veritable bouquet of buds for Valentine's Day enjoyment, which are more practical than flowers and have fewer calories than chocolates.

Figures from the Washington State Liquor and Cannabis Board show that cannabis sales have annually increased by more than double around recent Valentine's Days: Sales of \$798,392 in 2015 jumped 132 percent to \$1,851,972 in 2016, and then grew even more—by 154 percent—in 2017 to \$4,698,186.

Such numbers also reflect market



strategies now being embraced by companies like Denver-based LucidMood. By isolating terpenes—the organic compounds which lend cannabis strains their distinct aroma and flavor—they can be concentrated into oils for individual vaping. The aim is to provide a reliably predictable experience through taste and smell delivered through a variety of six formulas: Energy, Focus, Relax, Relief, Sleep and—for the romantically inspired—Bliss.

"This started with some research, some educated guesses, and then we did 600 observational studies to test whether those guesses were right," explained LucidMood CEO Charles Jones. "The difference between *indica* and *sativa*—why *sativas* tend to be more energizing, and *indicas* are more relaxing—is that the terpene profile for the *sativa* and the terpene profile for the *indica* are quite different in terms of how many terpenes are in the plant, and [how] those different terpenes account for the different effects and the different moods."

Though research on terpenes' effects on the brain are even more preliminary than research on the medicinal potential of cannabis overall, it's certainly something worth considering as legalization continues to expand the ways that customers ingest cannabinoids.

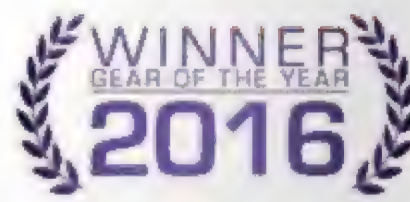
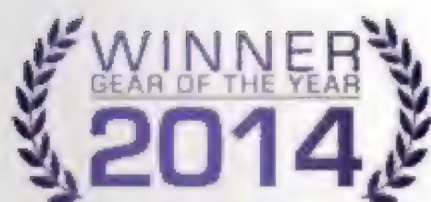
Another general trend of interest is that cannabis (especially in its edible form) is becoming more popular with women. A New Frontier Data survey found that while consumption rates of flower and extracted products are pretty even between genders, women consume edibles at a far higher rate than men.

Likewise, according to a 2017 report from GreenRush, women are significantly likelier to use cannabis for stress relief or to reduce anxiety—as well as for pain management, sleep improvement and nausea reduction—at rates higher than men. Differences in desired effects reported between the sexes will likely introduce more product and branding opportunities to appeal to respective preferences and priorities. GreenRush reported that from April to December 2016, men outspent women by 7.6 percent per transaction (\$69.35 versus \$64.44), but that the expenditure gap was narrowing. The variance reflected differences in the reasons that women consume cannabis, and which products they prefer to consume.

Such nuances in choice and purchasing habits by gender represent increasing opportunities for manufacturers and retailers to find their perfect matches. For those who find cannabis to be the spice of love, play on. ✨

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Thank you, High Times. Congratulations on your 500th issue!



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MARKET ANALYSIS

Prices by the ounce

Pot prices dipped across America in February, as legalization continues to make cannabis more accessible and affordable, especially in the Eastern and Western markets. However, while the US Price dropped to \$319 this month, the Southern Index experienced a slight increase, finishing at \$353 per ounce—\$2 above its previous month's average.

US Price Index

YTD Average: \$320



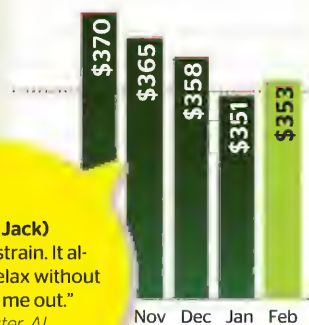
Eastern Index

YTD Average: \$344



Southern Index

YTD Average: \$352



Western Index

YTD Average: \$265



TRANS HIGH MARKET QUOTATIONS

STATE	CITY	STRAIN	PRICE
ALABAMA	Alabaster	Black Jack	\$300
ALASKA	Anchorage Wasilla	Sour Diesel King Tut	375 200
ARIZONA	Flagstaff	The Void	225
ARKANSAS	Fayetteville	Blue Dream	475
CALIFORNIA	Los Angeles San Francisco	Jesus Kush Gorilla Glue #4	260 240
COLORADO	Edgewater	Blue Dream	240
CONNECTICUT	Norwich	Granddaddy Kush	280
FLORIDA	Orlando	Mango Diesel	280
GEORGIA	Atlanta	Goji OG	280
HAWAII	Honolulu	OG Kush	450
IDAHO	Idaho Falls	Pineapple	280
ILLINOIS	Champaign Joliet	OG Kush Blue Dream	420 280
INDIANA	Indianapolis Lebanon	Lemon Haze Girl Scout Cookies	450 420
KENTUCKY	Albany	Critical Kush	360
LOUISIANA	Shreveport	OG Kush	280
MAINE	Bangor	Strawberry Diesel	280
MARYLAND	Baltimore	Ghost Train Haze	360
MASSACHUSETTS	Springfield	Girl Scout Cookies	280
MICHIGAN	Ann Arbor	Motorbreath	450
MINNESOTA	Farmington	Gas	320
MISSISSIPPI	Carthage	Headband	320
MONTANA	Billings	King Tut	225
NEVADA	Las Vegas	Deadhead OG	253
NEW MEXICO	Santa Fe	Green Crack	320
NEW JERSEY	Atlantic City	Blue Dream	200
NEW YORK	New York	Sour Kush	480
NORTH CAROLINA	High Point	Mango Kush	420
OHIO	Columbus	Super Silver Haze	480
OKLAHOMA	Shawnee	Reggie	450
OREGON	Salem	Green Crack	322
PENNSYLVANIA	Philadelphia	White Rhino	280
RHODE ISLAND	Warwick	Girl Scout Cookies	290
TENNESSEE	Nashville	Hydro	300
UTAH	Salt Lake City	Tahoe OG	400
VERMONT	Bennington	Lemon Haze	320
VIRGINIA	Winchester	Blue Diesel	320
WASHINGTON	Issaquah	XJ-13	260
WISCONSIN	Appleton	Lemon Haze	300
INTERNATIONAL			
AUSTRALIA	Newcastle	White Rhino	A\$475
CANADA	Hamilton	Lemon Skunk	C\$260
UNITED KINGDOM	Bedford	Cheese	£180

High Times wants to know what you're smoking. Submit your strain information including location and price by the ounce to thmq@hightimes.com, or tweet us (@THMQ).

(Critical Kush)
"Very High THC. The absolute strongest smoke in Kentucky!"
—Albany, KY

(Black Jack)
"I love this strain. It allows me to relax without knocking me out."
—Alabaster, AL

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HIGH TIMES 2018 VAPE PEN REVIEW

The *High Times* staff has once again scoured the cannabis world to bring you the most up-to-date information on the best vaporizers for concentrates and flowers. We evaluated pens for design, value, big hits, great taste and much more in our search for the very best vape on the market. Whether you're new to vaping and dabbing, or a seasoned cannasseur, there's something for everyone in this year's comprehensive roundup.

High Times published the very first "Vapor Pen Buyer's Guide" five years ago, when we were simply amazed by the stealth technology of vape pens to medicate and elevate on the go. Now that a few years have passed, our standards for a top-notch vaporizer pen are somewhat, well, higher. Vape pen companies are constantly updating manufacturing standards, product features, battery life, chamber size, design and functionality, refining products as the ever-changing cannabis industry blooms. For this year's review, we tested over 40 models for both ground herb and extracts, taking into account factors like vapor production, stealth, health, innovation, design, taste, value and ease of use. Instead of naming one pen the best overall, we rounded up the top 20 vape pens so you can decide which one is right for you.



EXXUS GO

Oil, \$99.99

exxusvape.com

Lightweight and compact

PROS: The Exxus Go is one of the only vaporizers with a triple coil atomizer. It warms up in a super-speedy five seconds. The quartz mouthpiece is easy to clean, and it can take on a ton of wax at once.

CONS: Not very portable, especially with the glass straw.



STORZ & BICKEL MIGHTY

Flower, \$349.99

storz-bickel.com

Efficient and sturdy

PROS: Storz & Bickel is the manufacturer of the famed Volcano vaporizer. This portable vape for flowers functions efficiently at precise temperatures—the vapor quality beats many desktop vaporizers. It's one of the few vaporizers that truly cools the vapor before it reaches your lips, using a patented combination of full hot-air convection heating and additional conduction. It features a digital display, plus physical buttons for adjusting the temperature. Larger than Storz & Bickel's Crafty, it has twice the battery life.

CONS: Expensive, but the Mighty is in a league of its own.



ROKIN NITRO

Oil, \$69.95

rokinvapes.com

One of the simplest, most portable pens

PROS: The sleek Rokin Nitro has three temperature settings and a dual quartz rod atomizer. The pen is made entirely of metal and contains no plastics, fibers or glue. Airflow holes prevent leaking and clogging. It'll give you big clouds of visible vapor every time.

CONS: If you're vaping high-quality concentrates, you may want a lower-temp vaporizer to preserve flavor.

SOURCE SLIM 4

Oil, \$89.95

sourcevapes.com

A simple design

PROS: The Source Slim 4 is a simple and effective vaporizer for oils, with larger coils than most vapes and easy-to-pull loading. There's a ceramic coilless atomizer and a dual quartz coil. Both pack a punch while retaining the flavors of your concentrate. The bottom unscrews to reveal a silicone wax storage chamber.

CONS: You can't control the exact temperature.

**SOURCE ORB 4**

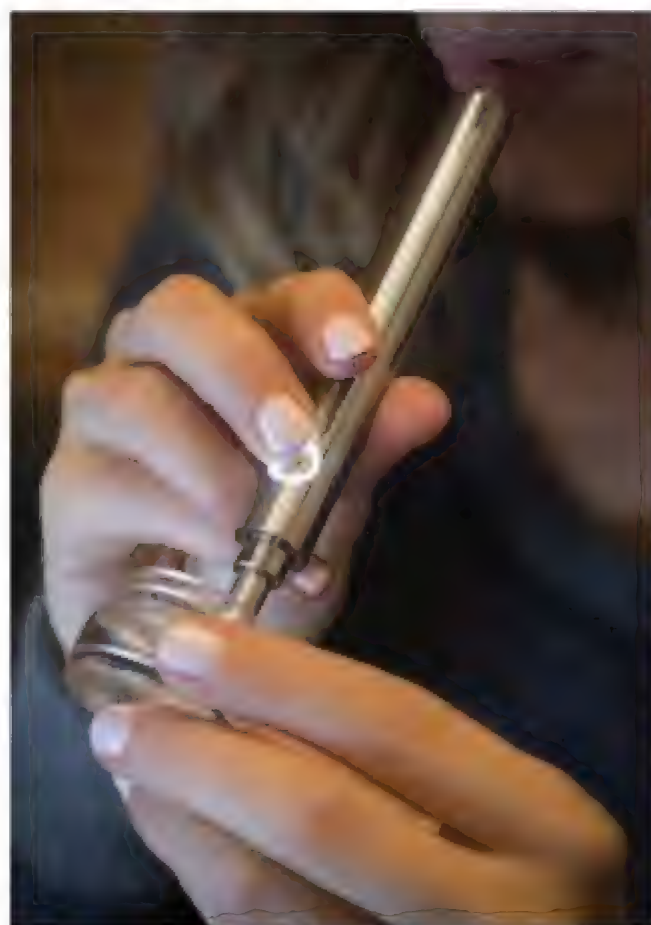
Oil, \$99.99

sourcevapes.com

Versatile and innovative

PROS: The top half of the Source Orb 4 is held together by magnets. After a while, most vape pens clog up, and sometimes it's nearly impossible to unscrew the top to refill it. With the Orb 4, you just tug at the top and it comes right off. The Orb 4 comes with titanium, quartz and ceramic atomizers, and the premium kit comes with multiple coils, plus a tool and a silicone chamber for storage.

CONS: It's heavy for a vaporizer pen.

**LINX ARES HONEY STRAW**

Oil, \$109.95

linxvapor.com

A portable electronic nectar collector

PROS: Normally, you would need a torch to use a nectar collector. With the Honey Straw, you press a button and dip the heating element into your concentrate while inhaling. You don't have to deal with the mess that comes with packing an atomizer. Just open the glass jar when you're ready for a dip.

CONS: Not ideal for dabbing small amounts.

VIVANT DABOX

Oil, \$59.99

vivant.com

Stands apart from the crowd

PROS: The Vivant Dabox's high-quality glass chamber makes for easy cleaning and helps cool vapor. It's easy to pack—the atomizer slides right out of the device when you open up the flip door. There are three coil options with varying flavor, visible vapor and heat-up times.

CONS: This pen takes up more space than the average vape, and there is a large breakable glass component.



**G PEN PRO**

Flower, \$99.99

gpen.com

Great for beginners

PROS: The G Pen Pro is a simple, affordable vape with three different heat settings to cycle through. The oven chamber is a little smaller than the next model up, the Elite, only holding about half a gram of ground weed.

CONS: The Pro takes about a minute to heat up, and the mouthpiece is plastic and fragile and it gets hot. To get a good amount of visible vapor, you have to tolerate the heat at the highest setting.

G PEN ELITE

Flower, \$149.95

gpen.com

Affordable and lightweight

PROS: The G Pen Elite features a digital screen with temperature control, and the large oven chamber is great for packing extra herb. It comes with a stirring tool, it's lightweight, and it fits nicely into a pocket. The Elite performs best when packed to the brim tightly with finely ground cannabis. It's one of the more affordable vaporizers for flower on the market.

CONS: You'll need to wait 30 seconds between hits if you want to see visible vapor with every toke. The silicone mouthpiece is close to the herb chamber and wears down from being removed and reattached every time you pack the vaporizer. It also clogs up with resin quickly.

**KANDYPENS PRISM/PRISM+**

Oil, \$97.99/\$127.99

kandypens.com

Easy options for vaping on the go

PROS: The Prism and Prism+ come with two atomizers: a coil-less ceramic and a dual quartz. The quartz is good for huge rips; the ceramic is better for more subtle, flavorful hits. There are three temperature settings. The glass mouthpiece with splash guard is easy to clean, and there's a replacement in case you break it.

CONS: The 900-mAh battery in the Prism+ way outlasts the smaller Prism's 320-mAh battery.

**DAVINCI IQ**

Flower, \$274.99

davincivaporizer.com

Sophisticated design

PROS: The DaVinci IQ uses conduction heating powered by rechargeable and replaceable 18650 batteries. The vaporizer features an LED grid display on the front and a sizable ceramic oven. It looks sophisticated and feels sleek in your hand.

CONS: The unit can get hot. Its battery life is only about an hour of usage time, so you'll need to carry extra cells if you want to stay medicated throughout the day.

KANDYPENS

PRISM

FEATURED IN 2018 **HIGH TIMES** VAPE PEN REVIEW



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WWW.VAPORNATION.COM

**CLOUD PEN PARAGON**

Oil, \$99.99

cloudpenz.com

Huge hits

PROS: The Cloud Pen Paragon has an air-control valve for adjusting airflow, and it's got three temperature settings. A hidden "No Goo" silicone-lined chamber stores your wax. The Paragon fits nicely in your hand.

CONS: The dual quartz rod atomizer is intended for big hits for heavy vapers.

**PAX 3**

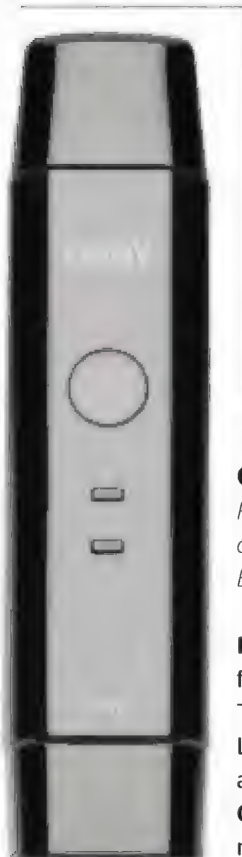
Flower/Oil, \$249.99

paxvapor.com

A top-notch dual-use vaporizer

PROS: The Pax 3 functions with both flower and extracts, heating up quickly and evenly and allowing for a healthy dose of vapor within 15 seconds. An app allows you to customize heating options through your smartphone. If you want a smaller individual pack, you can use the accompanying half-pack oven lid.

CONS: The mouthpiece can get hot on your lips.

**CLOUD F17**

Flower, \$139.99

cloudvapes.com

Easy to use

PROS: The Cloud F17 is more affordable than most flower vaporizers, and it's easy to use and easy to clean. The vape fits nicely in the palm of your hand, and its LCD screen displays the temperature, which is adjustable from 385 to 430°F.

CONS: The vapor quality isn't on par with some of the more expensive vaporizers on the market.

**AIRVAPE OM**

Oil, \$89

airvapeusa.com

One of the stealthiest pens

PROS: The AirVape OM has a super-stealthy keychain design, and it can be used with pre-filled oil cartridges. If you have your own concentrates, you can load them onto the dual quartz atomizer.

CONS: The small atomizer can be difficult to clean.

**DANK FUNG CONNOISSEUR**

Oil, \$89.99

dankfungextracts.com

Flavorful hits

PROS: The Connoisseur's self-regulating-temperature technology and ceramic atomizer offer optimal flavor and vaporization. The ceramic bowl is easy to clean. This vape pen fits in the palm of your hand.

CONS: You can't adjust the temperature, and there is only one coil.

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THIS THING RIPS R2 RIG

Oil, \$129.99

thisthingrips.com

Replace your torch and rig

PROS: The R2 Rig comes with a ton of goodies including a dab tray and replacement parts. The bottom of the vaporizer screws off, revealing a silicone chamber for on-the-go storage. You won't need a torch and nail when heating up, and it's much faster than heating a nail and waiting for it to cool.

CONS: Although there's no need to plug it in, it's not very portable, and it's far from discreet. It burns hot.



PUFFCO PRO 2

Oil, \$79.99

puffco.com

Sleek, portable and affordable

PROS: There are three heat settings on the Puffco Pro 2, just like the company's original award-winning pen. The Pro 2 is a small, stealthy device with a large ceramic chamber designed for maximum efficiency. Employ the "Sesh Mode" setting for huge hits.

CONS: Requires a fair amount of extract to perform at its best.



DR. DABBER AURORA

Oil, \$79.95

drdabber.com

A slim, convenient vaporizer

PROS: The Dr. Dabber Aurora is held together by fully magnetic connections. There are three coils to choose from: ceramic dual rod, quartz dual rod and ceramic dish. Three carefully calibrated heat settings allow you to choose your vaping experience.

CONS: The ceramic dish atomizer doesn't provide much visible vapor.



DR. DABBER LIGHT

Oil, \$39.95

drdabber.com

Low-cost stealth

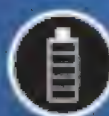
PROS: The Dr. Dabber Light is a stealthy little number that's super-portable and easy to use. And at just \$39.95, this pen is a fantastic value.

CONS: Its low cost means it's not the sturdiest.



Owar

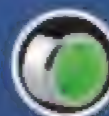
premium vaporizer for wax



1100mAh
Li-Ion Battery



Three temp
settings



Container with
Silicone



Triple quartz
coil



Pretty PLUS

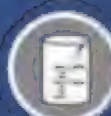
premium vaporizer for dry herb



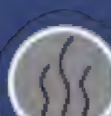
Pure Ceramic Chamber



Color Change



1.6ml Capacity



360° Heating Structure
Chamber

ABOUT ATMAN

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TOP VAPE PEN CARTRIDGES

One of the fastest-growing sectors of the cannabis industry, pre-loaded oil cartridges are available in all sorts of flavors. They're easy to use and simple to conceal, and they deliver effective hits with no mess. Here's a roundup of our current favorite oil-cartridge companies.

710 KING PEN

710kingpen.com

Award-winning 710 King Pen cartridges are available in several strain-specific flavors. Favorites include Cali-O, Jack Herer, Trainwreck, Skywalker OG, King Louie OG and Gelato.

PAX ERA

paxvapor.com

Top cannabis companies manufacturing oil cartridges, or “pods,” for the sleek Pax Era include heavy hitters Legion of Bloom, Temple, Level, Brite Labs and Bloom Farms. Each purveyor offers several flavors of oil.

ABSOLUTE XTRACTS

abx.org

With one of the most comprehensive lines of vape cartridges, Absolute Xtracts offers 18 strain-specific options of naturally sourced cannabis oil for your vaping pleasure.

OMG FARMS

omqfarms.com

The Rooster from OMG Farms is a pre-charged, ready-to-use pen filled with 500mg of premium Humboldt County-sourced cannabis oil.

POTTERS CANNABIS CO.

potterscannabisco.com

Potters Cannabis products have an appealing artisanal design—vape pen batteries are wrapped in hand-tooled leather, and oil cartridges are sealed with twine and a cork.

[illegible]



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PRECISION TEMP CONTROL

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REMOVABLE 18650 BATTERY

MICRO USB CHARGING

BLUETOOTH APP CUSTOMIZATION

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PRECISION VAPORIZER

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TOP VAPE PEN CARTRIDGES

BRASS KNUCKLES

brassknucklesog.com

Brass Knuckles currently offers six flavorful *indica*, six *sativa* and four hybrid cartridge options. Our absolute favorite is the Abracadabra hybrid version.

2WNTY3

2wnty3.com

This urban collective states that its mission is to "infuse art, music, fashion and cultural components into its purified line of cannabis infused products." Cartridges are available in *sativa*, *indica*, hybrid and 1:1 CBD versions.

HMBLDT

hmbldt.com

This ingenious vape pen is pre-loaded with oil that is delivered in 2.25mg doses. A slight vibration lets you know when your dose is complete. It's great for novice smokers.

EUREKA

eurekavapor.com

Pre-filled cartridges in 500mg or 1g and disposable 250mg pens of CO₂-extracted pure cannabis oil are available in an impressive array of 30-plus strains.

THE CLEAR

clearconcentrate.com

The Clear's glass cartridges contain 500mg THC and are available in 17 flavors including Blueberry, Golden Goat and our favorite, XJ-13.

DOUBLE BARREL

doublebarrel.com

Double Barrel's brass-knuckles style dual vape allows you to mix and match oil cartridges for the perfect high. The metal housing slides onto a comfortably weighted two-finger ring. No charging or buttons involved—just pull on the mouthpiece for smooth, pure hits.

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VapeGossipGirl

“EXCELLENT
VAPOR TASTE,
PURITY, POTENCY,
& SMOOTHNESS!”



Vaporizer Review

“THE PULSAR APX SMOKER IS THE
FUTURE. I DON'T HAVE TO FUMBLE
WITH A LIGHTER ANYMORE, EVEN
ON THE WINDIEST OF DAYS. AND BY
TAKING A FLAME OUT OF THE
EQUATION, I GET THE BEST FLAVOR.”



Leafly

“FEATURES A SMALL FRAME,
WHICH MAKES IT EASY TO
GRAB AND GO. AS WELL AS
IT'S CONVENIENT READY
LIGHT LETS CONSUMERS
KNOW WHEN IT'S THE
PERFECT TIME TO PULL.”



www.PulsarVaporizers.com

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CLASSIC
SMOKE

COOL
DAB

ATTENTION Organic Growers:

Now You Can Bring
The Goodness of
Mother Nature

Into Your Grow Room With
Advanced Nutrients
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Daytime Highs

As THC percentages continue to soar, some smokers are opting for less potent pot. Whether you're nostalgic for the days of mellow weed or simply seeking a daytime smoke for a functional buzz, here's everything you need to know about high-quality, low-THC cannabis. *By Reggie Dankers*

How high can you get before it brings you down? How low can THC go before it doesn't get you high? There's a question that's recently been on many minds: Is our pot too potent? Some people view this as a quality-versus-quantity issue, but are these properties mutually exclusive? If you talk about weed with one of those OG acid-dropping, protest-rocking, barefoot hippies from the 1960s, they always comment on how strong the pot is these days. Careful selective breeding took the old-school powerhouse strains (Thai, Colombian, etc.) and turned them into the creatively named strains we know and love today. At this point, with THC percentages in the high 20s to

low 30s, academic botanists marvel at cannabis's ability to produce the most active drug substance of any plant in nature. We may have gone as potent as the plant can take us, so it makes sense that people would want to go in the other direction.

This isn't *the man* coming in and telling you to dial it back; the low-THC trend is native to the cannabis community, however counterintuitive that may seem. Who are these low-THC fans? How did this trend start? What are the advantages of low-THC pot? We'll explore these and other questions in the following pages, and, who knows, we may convince some of you naysayers to reconsider THC content.

The Tipping Point

Most of the pot that people smoked before the 1960s and '70s originated in Mexico and came from strains that, while not originally from the area (cannabis is native to Asia), had adapted to the climate after decades of growing in the open fields. It didn't take much time for people to start planting seeds from this pot in rural forests or on the side of freeways. At \$20 an ounce (close to \$100 or more accounting for inflation), this relatively affordable pot fueled the youth revolution that protested the war and attempted to take down the patriarchy. Lab tests from the era indicate this pot

sidebar on page 64), and THC contents of around 10 to 15 percent became commonplace. Touring bands like the Grateful Dead are also credited with spreading kind bud and information about good grow practices across the nation to places that wouldn't otherwise have access to them. As the '80s turned into the '90s, globalization and modern technology started to intervene, and sinsemilla (seedless weed) became commonplace. High-wattage grow lights, coupled with networks of secret-sharing growers, gave birth to strong strains like Chem Dog, Northern Lights and Skunk #1. The mid-'90s and the turn of the millennium

lab getting paid to doctor results, or maybe their techs are too high to run the machines? Although we initially contemplated how to debunk this seemingly impossible feat of botany, a few dabs later we changed our minds. Thirty-four percent is suspiciously high, but there's no reason it can't be done. A quick call to T.H.Caeczar, our trusty field reporter in Colorado, confirmed the results as well.

Currently, the average THC content of black- and legal-market cannabis hovers just above 17 percent, a nearly fivefold increase from the landrace North American cannabis we started out with in the 1950s.

Through the ages, trends in literature and art have seen flips and flops between hyper-decoration to austere simplicity, from elaborate descriptiveness to succinct minimalism. Newton's oft-quoted third law—*Every action has an equal and opposite reaction*—seems to hold as true for bowling balls and pins as it does for weed, which shouldn't come as a surprise to anyone.

Ironically, the rise in the popularity of dabbing may have given the first inkling of the turning point away from high-THC weed. Many breeders and cultivators started to focus efforts on making the most terpene-rich plants possible. Extraction for butane hash oil (BHO) pulls off all the cannabinoids and essential oils in the plant and makes a high-THC product one way or another. If an extract artist wants to really stand out, he needs to source the most flavorful cannabis he can get, and, consequently, THC content takes a back seat.

The Appeal of Lower THC Content

The movement toward low-THC weed is multifaceted, and it all starts with legalization. As the War on Drugs eases slightly on cannabis, the industry has become subject to the same consumer influences as the alcohol and food industries. Recent years have seen an incredible shift in consumer tendencies toward artisanal and healthier options made by smaller companies. As a consequence of America's realization about how shitty processed foods are, large distributors like Procter & Gamble have seen serious downturns in their profits and have started rethinking their marketing campaigns. Multinational beer distributors like Anheuser-Busch InBev SA/NV (Bud, Corona, Stella, Beck's) have taken such a hit from the craft-brew sector, which now makes up almost 13 percent of the market by volume, that they have aggressively acquired craft labels like



had THC contents ranging from 3 to 5 percent, with similar amounts of cannabidiol (CBD) as well.

This wasn't the only pot the hippies smoked; Southern Cali surfer-smugglers, backpacking hippies in Morocco and rebellious soldiers who couldn't avoid the Vietnam draft quickly opened up America's cannabis repertoire. Colombian Gold, Acapulco Gold, Moroccan hash and Thai stick became the delicacies that broke up the monotony of the tried-and-true backcountry bud.

As the 1960s turned into the '70s, and the '70s turned into the '80s, interest in home growing started to surge. Hobbyists and profiteers sourced the best seeds they could find that often came from potent Thai stick and Colombian Gold nuggets. These strong strains originate from regions known for high-THC weed (see

gave birth to the age of the internet, and growers were no strangers to this technology. Secret online forums popped up, and breeders who never met in person traded clones through the mail. Soon, high-quality cannabis was making voyages across the nation from east to west and across the Atlantic Ocean to Europe. Some of the first strains to contain over 20 percent THC were probably grown around this time. Maverick seed companies started to pop up in the liberal Dutch culture, along with competitions like the High Times Cannabis Cup, which increased access to genetics and new techniques.

Cut to 2016 and the *High Times* staff is in disbelief about the latest numbers on THC content: Blissful Wizard by the Captain's Connection—34 percent! *How could that be possible? It must be a shady*



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In the age of '90s movie-remaking, typewriter-collecting, ancient-grain-eating, suspenders-wearing hipsters, it's easy to assume that the low-THC trend is just another piece of nostalgia millennials crave, but that's not correct. Despite what you might think, your typical Portland indie kid doesn't smoke enough pot to give it the same attention as his locally sourced beard oil or small-batch, cold-brew nitro coffee.

Legalization has opened up the market to new smokers—that is, people that have always had an open mind about cannabis but were weary of getting caught and making shady deals on the black market. Similarly, baby boomers who got high before they had kids, and stopped for fear of getting caught when sentences got harsh in the '70s, now have the opportunity to legally buy pot at a corner shop. At the same time, veteran potheads have gained access to more strains than they ever thought possible. In addition to recreational smokers, medical consumers, wary of paranoia-inducing, powerful pot, now have the option to legally seek cannabis products with a CBD/THC ratio of their choosing.

Low THC, Low Class?

These days, and for the past 10 or 15 years, weed with THC content below 10 percent typically comes from south of the border, brought up in huge bales and sold through a network of cartels and urban trap houses. Whatever you call it, it's always pretty much the same, and always pretty much shitty. These Mexican-grown strains likely descended from the same pot that has been growing in Mexico since the 1950s. Loose selective breeding has led to a steady increase in potency, but it likely won't go up much more given the climate and cultivation techniques.

Selling at around \$90 to \$120 an ounce and \$20 an eighth, this has always been the pot for folks who can't afford to buy the pricier stuff at \$20 a gram or \$50 to \$60 an eighth. Consequently, low-THC pot has a serious negative connotation to it. Not just for being cheap, but because it originates from often careless cultivation that might result in serious contamination, with shady practices like spraying with sugar water to increase weight—and, of course, the fact it's brought up in giant bales from Mexico by murderous cartels and sold through a network of gun-toting gangsters.

Buying Cali bud or local hydro from

a friend without a doubt gives you the advantage of a safer purchase. While dangerous buys from sketchy dudes used to be the standard, times have changed. US production has soared to the point that the cartels don't really make much money on cannabis anymore. In fact, some of our American pot has started to make its way down to Mexico.

Redefining Quality

The negative connotation tied to Mexican regs is perfectly understandable, but does this bad rep have to follow any strain that doesn't produce THC content of 15 percent or more? Although it shouldn't, younger connoisseurs may still have scornful knee-jerk reactions. More seasoned smokers reminisce about the strains formerly considered the strongest—now blown out of the water by modern genetics—and seize the nostalgic opportunity to smoke the weed they grew up on. Acapulco Gold (15 percent), Hashplant (13 percent) and Kali Mist (15 percent) are all still perfectly capable of knocking someone out if smoked enough, though they saw their zenith long before the days of the true one-hit-quit shit.

As modern strains are bred together to the point that many of them are



THE HASH IN SPAIN

Spaniards love their hash. *Porros* (joint smokers) break up the sweet-smelling product and mix it with tobacco for a casual and flavorful smoke. Weed is also pretty common in Spain, but many smokers prefer hash because pot gets them too high and too paranoid.


I was curious as to why hash had such a mellowing effect compared with common strains on the Iberian Peninsula like Jack Herer or AK-47. Arjan Roskam, the founder of the Green House Seed Company and star of the show *Strain Hunters*, has traveled the world in search of great pot. During a trip to the legendary Rif Valley in Morocco, Roskam found that different cannabis varieties growing right next to each other end up together in the hash, which has nearly equal amounts of THC and CBD. So, while a hash joint might deliver the same amount of THC as a weed joint, the added CBD makes the high completely different.



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indistinguishable from each other, even the people that once yearned for high-THC weed want to go back. The fact is that the older strains have more unique genetic traits, which is part of the reason why they have served as breeding stock for the cannabis of today. Grandfather strains like Skunk #1 (Afghan x Mexican x Colombian) or Haze (Mexican x Colombian x Thai x Indian) derive their lineage from this old pot and have gone through hundreds, if not thousands, of generations of crossbreeds, backcrosses, self-crosses, etc. to make the cannabis we know today.

CBD to the Rescue

Sanjay Gupta's medical-cannabis coverage on CNN, beginning with his marijuana mea culpa "Why I Changed My Mind on Weed" in 2013, had a massive impact on the country. Suddenly, Americans who've been systematically lied too about the evils of marijuana for their entire lives realized that medical marijuana was a true lifesaver. This colossal shift in attitude was the tinder, the gas and the match that lit a CBD fire under the asses of growers around the country. Mainstream media coverage illustrating the benefits of medical cannabis often focused on the non-psychoactive component CBD, and the CBD-only strain Charlotte's Web took the front and center in the fight against childhood epilepsy. Interestingly, the genetic lineage of Charlotte's Web can be traced to two well-known CBD-rich strains that have been around for a long time: Harlequin and Sour Tsunami. Still, the timing was right for Charlotte's Web to become synonymous with compassionate cannabis use.

The use of medical marijuana isn't limited to the treatment of physical conditions like epilepsy, cancer or AIDS; it holds hope for psychological conditions like post-traumatic stress disorder and anxiety as well. The numbers of those suffering from PTSD—particularly military veterans—are staggering: Between 11 and 20 percent of Operation Iraqi Freedom and Enduring Freedom, 12 percent of Gulf War and 15 percent of Vietnam veterans currently suffer from this debilitating condition. Of course, PTSD isn't limited to war vets. Up to 8 percent of the general population will develop this disorder at some point in their lives.

Established medical treatments for PTSD underserve patients and often lead to benzodiazepine or opiate addictions that can bring about a further decline in sufferers' quality of life. On the other hand, cannabis has limited to zero

addictive potential and is completely nontoxic. Perhaps discovered anecdotally, treating PTSD with cannabis has serious scientific research to back it up at this point. We don't understand the exact mechanism, though scientists believe it has to do with cannabinoids' ability to inhibit retrograde signaling. Depending on the origin of the trauma, daily events can trigger PTSD attacks, causing neurons firing on all cylinders to feed off each other in a vicious cycle. Activating cannabinoid receptors stops neurons from signaling back, slowing down the cycle. Without double-blind clinical studies, doctors have their hands tied and are not allowed to give official recommendations, but research funders on the state and federal levels are slowly opening their pocketbooks to allow these expensive trials to get underway.

Vietnam vets who treated their PTSD with cannabis in the '70s probably had more luck than Iraq War veterans have today if they go straight for the strong weed. In fact, today's strong pot can

sometimes do more harm than good by triggering extreme paranoia and anxiety. The reason? THC's effect on the brain is dose-dependent: Low doses have a calming effect; high doses can cause anxiety.

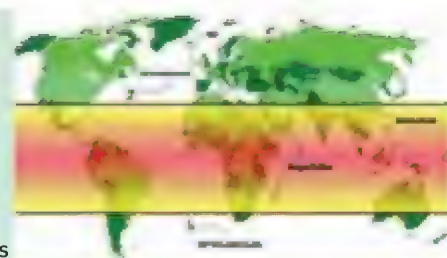
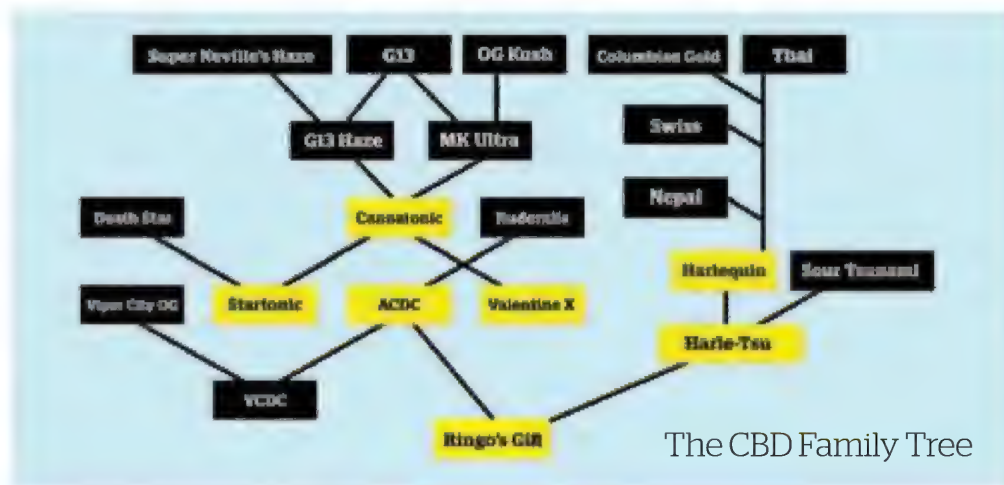
THC directly activates the main cannabinoid receptor, CB1, while CBD has an opposite effect and modulates THC's impact. CBD literally binds to a different spot on the receptor than THC does. In doing so, CBD drastically tempers the paranoia-inducing effect of THC. Smoking pot with an even ratio of the two still gets you high, but the effect is much more relaxing and less heart-racing. Research on the interplay between these two cannabinoids continues to indicate that varying ratios of the two may serve different purposes for different people, but the lack of specific details forces smokers to do their own research through trial and error. This can be dangerous for someone with a severe mental disorder, but, unfortunately for now, the plant's legality restricts the medical research our society so desperately needs. 🌿

A NOTE ON BOTANY

Historical evidence shows cannabis originated in the Asian steppes, and has been carried by humans to almost every corner of the world. The result? A species so varied that biologists consider it to be the most genetically diverse and versatile plant to ever exist.

Cannabis produces around 60 different cannabinoids in its buds, but the dominant two are tetrahydrocannabinol (THC, the psychoactive component that gets you high) and cannabidiol (CBD, a non-psychoactive component touted for its medical uses). Curiously, cannabis that grows between the 30th parallel north and the 30th parallel south produces almost all THC, while cannabis growing above the 30th parallel north is CBD-dominant. Not only that, but CBD-dominant strains taken from their northern terroir to more equatorial regions will adapt to the heat and sunlight and turn into THC-dominant strains after a number of generations. The running theory holds that exposure to ultraviolet light contributes to THC production. Latitude isn't the only variable affecting potency, though; altitude also plays a role.

The three crown jewels of hash lie right above the 30th parallel north in rugged, mountainous areas: Morocco's Rif Valley, Lebanon's Beqaa Valley and the Hindu Kush (don't be fooled by the term valley, those two places are high above sea level). The interplay between high-altitude exposure to UV light and the fact that these regions are located slightly above the 30th parallel north mean the fields of weed in these three places comprise an almost-even mix of CBD-dominant and THC-dominant strains.



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Growing plants without soil requires an understanding of hydroponic concepts, technology, systems and best practices. Our expert hydro correspondent reveals the details for soilless success.


By Erik Biksa

Growing crops using hydroponic methods is not a new concept by any stretch of the imagination. The origins of “urban farming” that we hear of today have long and deep-reaching roots emerging from as far back as the ancient Hanging Gardens of Babylon and the pre-Columbian Aztec empire.

Cannabis plants can thrive in hydroponics (Greek for “growing with water”). Most cannabis strains take to water-based growing systems like a duck does to water. Marijuana plants are heavier-feeding plants from both a water and nutrient perspective, so the more water and nutrients they take up in a healthy growing environment, the bigger, heavier and stickier they can get.



2018 HYDRO



Hydroponically-grown plants exhibit explosive growth rates.

OPTIMAL ROOT ENVIRONMENT

Most of the root growth and nutrient-solution absorption by cannabis plants occur directly in the aerated nutrient solution rather than in the medium or substrate. A nutrient solution, in hydroponic terms, is composed of clean or filtered water that has exacting ratios of the elements required by plants for a given growth phase that is maintained at the correct temperature and pH level (the balance of acidity to alkalinity).

GET IN TOUCH WITH THE DARK SIDE

On the flipside, think about the aerial environment of plants at the canopy level. When temperature, humidity, carbon dioxide and air exchange are met at optimal levels, buds grow big and healthy faster. Plants live in two very different worlds at the same time: the aerial environment and the root environment. Growers have a tendency to think mostly about what they can see, but it's important to think about and understand what's going on down below in the root zone.

SUPERCHARGED GROWTH RATES

A well-aerated hydroponic nutrient solution (from air pumps or recirculation pumps) contains higher levels of oxygen than can be found in soil conditions. Roots love oxygen, and the difference when enough is supplied can be profound; an oxygenating nutrient solution supercharges the root zone, making nutrient and water absorption incredibly efficient for plants.

The exacting and optimal conditions created in the root zone via well-designed and constructed hydro systems provide uninterrupted nutrient and water absorption. One of the biggest advantages that hydroponics has in accelerating growth and development is the stability, consistency and replicable nature of the water, mineral and oxygen levels in the root zone.

Report

GROW MORE WITH LESS WATER & FERTILIZER

Healthy cannabis crops can absorb lots of water when grown large or in high densities during the peak bloom cycle. If you aren't growing in a closed hydroponic system, it's a good bet that you're losing a tremendous amount of the water through evaporation from the growing media in your beds, containers or planting holes.

Most experienced growers who have grown in both hydro and soil/soilless growing methods will observe a near-50 percent reduction in the amount of water they apply for topping up reservoirs compared with irrigation of beds or containers filled with growing media.

Another common observation by experienced growers using supercharged water-culture systems is that significantly lower fertilizer levels are required to support healthy and heavy-yielding crops of buds. Since the conditions for nutrient absorption and transport in the plant are optimal in these types of systems, there is no need to "force feed" plants as there is with soil and soilless conditions; hydroponic crops can take up as much as they desire at any time, uninterrupted.

HYDROPONICS FOR EVERYBODY

You don't have to be a master horticulturalist to reap the benefits and rewards of growing cannabis with water culture. As a matter of fact, there are plenty of first-time indoor growers who choose hydroponics and enjoy continued success with ease.

There are almost as many system types as there are growers using them. Proven and well-built hydroponic systems are widely available at reasonable prices. Consider that a hydroponic system is a small investment relative to the value of the crop you stand to harvest over several years. Typically, there's little to replace or throw away between crops with water-culture systems. Simply clean out tubs, scrub with a little bleach and water, rinse and plant again—this can all be done on the same day of your harvest, making your growing space more productive with potentially more crops per year, requiring less work and replacement costs.

Hydroponic growing media like grow stones, lava rock or clay pebbles can be reused nearly indefinitely. Remove any old root debris and rinse well in a mild nutrient solution at the correct pH, and they are ready to fill into net pots or containers again. Rock-wool is a popular hydroponic growing medium, although it is best used as a propagation material where a relatively small amount is required, rather than a final growing media, because it is costly to replace and difficult to dispose of in a conscientious manner.

BASIC HYDROPONIC SYSTEM TYPES



Under Current systems recirculate highly-oxygenated nutrient solution.

DWC/RDWC (deep-water culture/recirculating deep-water culture)

Basics: A small amount of growing media supports plants placed on a lid above a depth of a sturdy container holding well-aerated nutrient solution. Roots grow into the depth of solution and feed freely. If recirculated, a water pump draws the nutrient solution through the root zone and recirculates through connected pods or modules (containers with lids).

Advantages: There are lots of them for this quintessential hydro system—basically all of the advantages we discuss in this article. It can be built cheaply and easily as a DIY system from available parts, and, for serious growers, there are complete and proven professional systems available.

Limitations and challenges: Keeping the modules from overheating past 75°F under artificial grow lighting before the crop develops enough leaves to shade the lids is something to watch out for, although there are plenty of solutions to this common problem.

FLOOD AND DRAIN OR EBB-FLOW

Basics: Containers or grow cubes sit in a specially made "flood table" with grooved bottoms and raised sides. The majority of the plant roots will grow between the media and the flood-table surface. Nutrient solution is pumped into the table to a depth that will partially submerge the containers or cubes on a timed cycle. When the pump shuts off, the solution is drained back into the reservoir, ready for the next recirculation cycle.



Trays are periodically flooded to feed plants in rock-wool cubes.

Advantages: This system is reliable and offers a good level of moisture-level control in the root zone; yields can be very good with high planting densities as with SOG (sea of green) high-density cropping methods.

Limitations and challenges: It's best for smaller-stature plants as the table height above the reservoir and average ceiling heights may limit growth space when used with high-output lighting. Flood tables can be bulky and cumbersome to ship or move around, and they take up a lot of space in the growing area.

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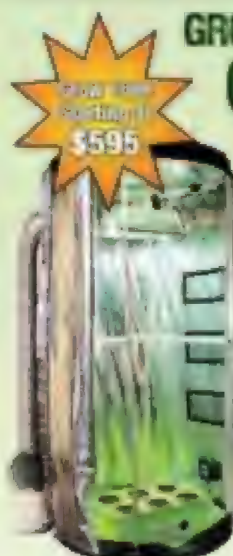
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NFT (*nutrient film technique*) or tube systems

Basics: A shallow depth of nutrient solution moves from a slightly elevated end on the inside of a supportive channel or tube across the entire length of the bottom then out through a drain on the opposite end of the channel or tube. The nutrient solution is recirculated continuously in NFT systems.

Advantages: The system is highly scalable, and it allows for easy perpetual harvesting cycles. It's possible to harvest 26 times per year using multiple stages of NFT cropping with high plant densities in a relatively small area. The system is very automation- and labor-friendly.

Limitations and challenges: It's best suited to smaller-stature plants in high densities. Power failures or clogged lines can be disastrous, although they are entirely preventable with the proper setup.

DRIP SYSTEMS & TOP-FEED BUCKET SYSTEMS

Basics: Plastic "spaghetti" lines deliver water and nutrients via a water pump from a reservoir, either recirculating or as a drain to waste applications to pots, cubes or buckets. There are many variations on these types of setups, and they use common irrigation emitters and parts, which make them popular with the DIY set.

Advantages: They're highly flexible, and a variety of growing media can be used or may be adapted for water culture, i.e., bucket systems. They're great for reliable and effective low-cost hydroponics with a professional system. Highly precise moisture management is attainable.

Limitations and challenges: They tend to be maintenance-intensive, as emitters and spaghetti lines are prone to clogging over time with "salt" buildup, even with proper filtration equipment.

AEROPONICS

Basics: In a sense, these use fuel-injected and supercharged hydroponics. Plants can grow incredibly fast in a fine-tuned and well-maintained aeroponics system, which uses pressurized sprayers to deliver a fine mist or wide spray of fine nutrient-solution droplets to bare-rooted plants supported by a lid covering the internal root chamber. The large surface area of the nutrient mist creates dramatic oxygen levels with high levels of nutrient penetration directly into plant roots.

Advantages: Incredible growth rates and crop development are achievable with aeroponics. Aeroponics are often a first choice for hydroponic growers interested in rooting cuttings for transplant into other systems.

Limitations and challenges: Aeroponics can be unforgiving with errors (clogged sprayers, etc.). This system is best reserved for high plant densities with fast crop turnaround times; it's built for speed.

**GETTING STARTED WITH HYDROPONICS**

Having good-quality water out of the tap or well is a huge bonus for growing with hydroponics because your water condition counts. Impurities in water can react with the ingredients in your nutrient solution, which will hurt the performance of your plants. Water filtration for hydroponics is widely available with lots of selection for different-size applications—with reasonable prices. Reverse-osmosis filtration is optimal, although two-stage particulate filters that capture sediment and chlorine can do much to improve water quality too.

For smaller systems, water can be managed with buckets from the source, while for larger setups you'll want to be able to access your water supply for the garden within the growing area.

HYDRO OUTDOORS?

Hydroponic growing performs great indoors or out. Sturdier and heavier systems are preferred for the outdoors when there is no greenhouse or shade structure. A strong wind can pick up a flood table and send it sailing if it's not properly anchored into position. Shade structures are a good idea outdoors—anything that allows you to use different degrees of shading throughout the season can help prevent your nutrient solution from overheating while also providing some stealth for cannabis crops. In some situations, a water chiller may be required.

RECAPTURING PURE ATMOSPHERIC WATER FOR HYDROPONICS

While the methods described here are not exclusive to hydroponic growing, they are most easily utilized for maximum benefit when cultivating buds with hydroponics.

The fundamental principle at work in capturing water for reuse in growing systems is that plants transpire almost all of the water they take up through their roots as water vapor from tiny openings in the leaves. It's the water that keeps plants upright—they don't have any bones!

All of this water has to go somewhere. Indoors or in greenhouses, it is either vented away by fans or captured and drained away as condensate by air conditioners and dehumidification equipment. Wait, stop right there!

The water that plants transpire is pure and "alive," as it has been filtered by the plants

Top: NFT systems use a constant flow of nutrient solution.

Middle: Drip emitters release nutrients to plant roots slowly.

Bottom: Aeroponic roots dangle in oxygenated nutrient solution.

Afgoo



HIGH TIMES
XJ-13





Conspiracy Kush



themselves. Collecting condensate from growroom air conditioners and dehumidifiers can drastically reduce the amount of tap water you will need to filter each time you top up your reservoir.

As long as the condensate is discharged through clean appliances and is not exposed to strong light or organic debris, it's an excellent source of water for your growroom. As a precaution, there are also compact water-treatment systems designed specifically for the purpose of filtering condensate in the growroom or greenhouse—for example, particulate-filtration and UV-sterilization systems.

TECHNIQUES & TACTICS OF EXPERT HYDRO CANNABIS GROWERS REVEALED

SANITATION

You may have heard that cleanliness is next to godliness. This certainly holds true in hydroponics. The solution inside your hydro system can be managed for an entire crop—with proper management, there is no need to dump and refill large volumes of solution. Experienced hydro growers do not add unrefined organic ingredients, and they typically

stick with mineral solutions—although there are a few certified organic formulas that work very well in water-culture systems. Adding organic ingredients into a highly aerated solution with no growing media can be like throwing diesel fuel into a camp fire. It's best avoided. Otherwise, you are looking at an unconfined explosion of microbial growth and organic residues that attract and harbor unwanted pathogens.

TEMPERATURE

The rule of thumb that most hydro growers who crop buds follow is not to let the nutrient solution get warmer than 72°F. However, this doesn't mean that you can't.

While lower reservoir temperatures help to prevent unwanted microbial growth and keep higher DO (dissolved oxygen) levels, lower root-zone temperatures slow a plant's metabolism and may not always be practical to achieve—for example, when growing in a greenhouse during the hot months or under lights with cooling fans blowing in outside air.

The solution: Keep organic-based fertilizers or nutrient additives out of your solution when you are operating a hydroponic system that will average over 72°F. Add hypochlorous acid (a special plant-friendly “bleach”), following the manufacturer's directions. It's usually

best to apply lower dosage rates more often—for example, every three days. Hypochlorous acid is effective in keeping microbial populations in your hydroponic system low when temperatures are warm. Warm temperatures, microbes and organic materials, when combined together, are a recipe for trouble in most hydroponic setups.

ORGANIC HYDROPONICS

Having a true water-culture hydroponic system that can consistently deliver good yields while operating with organic nutrients can be a reality, even for novice hydro bud gardeners.

Historically, this was like skating on thin ice: It's doable, but risky. That's because growers made their own teas or used other less-refined or rawer organic ingredients that were prone to unpredictable biological reactions in a highly aerated root environment.

The trick for successful and productive organic hydroponics is to use only highly refined organic nutrient solutions that are intended (and tested) for use in recirculating water culture. For example, five-stage fermented colloidal molasses nutrient bases have proven to be highly effective, and there are other organic complete-nutrient kits perfect for hydro cannabis now available.

4 HOT NEW HYDRO PRODUCTS by Danny Danko

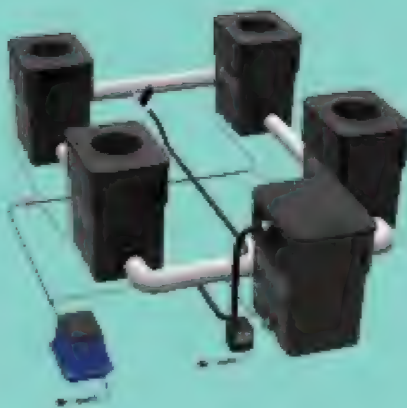


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advancednutrients.com

This new mobile app from the growers at Advanced Nutrients provides detailed product descriptions, a nutrient calculator and feeding charts that allow you to customize and save your particular calculations. It's available on iTunes and Google Play.



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This unit from AutoPot allows anyone to get started growing hydroponically. It grows a single plant in the medium of your choice and can be easily extended to grow more plants connected to the same reservoir tank.



7 HYDROPONIC NUTRIENT LINES YOU SHOULD TRY by Danny Danko

ADVANCED NUTRIENTS

For years the only hydroponic nutrient company that tested and marketed its products specifically for cannabis, Advanced Nutrients remain at the forefront of soilless growing technology. advancednutrients.com

SUITE LEAF NUTRIENTS

This new company on the scene has created a serious buzz among cultivators with its clean and green line of plant foods as well as a philosophy of "less is more" that

encourages growers not to over-feed their plants. suiteleaf.com

GREEN PLANET HYDROPONICS

The award-winning products from Green Planet are intended to simplify the hydroponic process, which the company provides to suit any grower's needs. The Dual Fuel formula was developed specifically for aggressive plant growth. mygreenplanet.com

HURRICANE HYDROPONICS

The plant foods from Hurricane

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CUTTING EDGE SOLUTIONS (CES)

Beginners and experts alike love the three-part hydroponic plant-feeding system from CES. With no added dyes, no clogging of drip tubes and no PGRs (plant-growth regulators), these nutes are top-notch. cuttingedgesolutions.com

SKUNKWERKS RX

This relative newcomer has caused quite a stir with its all-in-one formula and two-part version that's affordable, simple-to-use and highly concentrated. skunkwerksrx.com

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A large indoor cannabis cultivation facility, likely a greenhouse or warehouse, filled with rows of cannabis plants. The plants are growing in a controlled environment with artificial lighting. The structure is made of metal frames and translucent panels, with numerous hanging lights illuminating the space. The plants are densely packed and appear to be in various stages of growth.

GREENHOUSE

Rewarding yet complex, greenhouses can net big yields *Story & Photos by Nico Escondido*

Imagine if you could bring the power and quality of the sun into your indoor garden. With a perfectly controlled environment combined with the intensity and spectrum of sunlight, your plants would be happier and healthier than ever, and the results would show in yield, flavor and potency.

However, while this scenario might be ideal, it is also harder to achieve than many people think. Still, greenhouse cultivation of cannabis has steadily grown in popularity over the years as restrictions on its legality loosen and more states come online in both the medical and recreational markets. For our purposes here, let's focus on how you can use both the sun and a controlled environment right in your own backyard with a homegrow greenhouse.



GROWING



BACKYARD GREENHOUSES

When it comes to greenhouses, growers have their choice of virtually any size structure they need as well as several different styles. For those who are setting up shop in their own backyard, the first decision to make is whether to build a permanent building or to utilize something of a more temporary nature.

In terms of permanent or semipermanent structures, greenhouses can

be described as *attached*, *detached* or *multi-span*. Attached greenhouse designs are simple and less expensive as they are exactly what the name describes—attached to another permanent structure such as a garage or the side of a home. Because these greenhouses share common structural elements (such as walls) with another structure, fewer building materials are necessary and the cost of construction goes down.

Detached greenhouses are freestanding, stand-alone structures that consist of four walls and a ceiling. These greenhouses, which come in all shapes and sizes and can be placed anywhere the grower desires, are generally referred to as *A-frames* or *even-span* greenhouses, and their primary advantage is that they can be strategically positioned to take advantage of nature's elements, such

as sunlight, wind and water. Similarly, *multi-span* or *connected* greenhouses are those that have been joined together along the eaves to create large, undivided spaces. Multi-span greenhouses are less ideal for home growers and are usually reserved for large-format, commercial grow operations.

For home growers looking for small, more affordable solutions, there are a few popular—and less permanent—alternatives. These options include *cold frames* and *hotbeds*, which are both easy to set up and are semi-climate-controlled structures for growing plants on a smaller scale at home. A cold frame is any structure, of any size, that is

covered with translucent, heat-trapping material such as clear, thick plastic or thin plate glass. It is usually built with inexpensive wood or plastic and can even be a simple hoop house, which is constructed from bent poles and covered with clear plastic sheets. Hotbeds simply are cold frames fitted with any type of heating system. These greenhouses can be the size of a large box with peripheral access from the sides or large enough for a person to walk through with a couple of earth beds or elevated tables inside.

Cold frames are heated by sunlight, which keeps operational costs low. However, cold frames are less stable and not very durable in extreme weather. They also do not lend themselves to any sort of extensive environmental-control equipment, as do the larger, more permanent greenhouses mentioned above.



Top: A basic detached greenhouse with plastic walls and roof
Middle: A smaller, attached greenhouse
Bottom left: A large, attached cold frame greenhouse
Bottom right: A stand-alone cold frame with wind-break walls

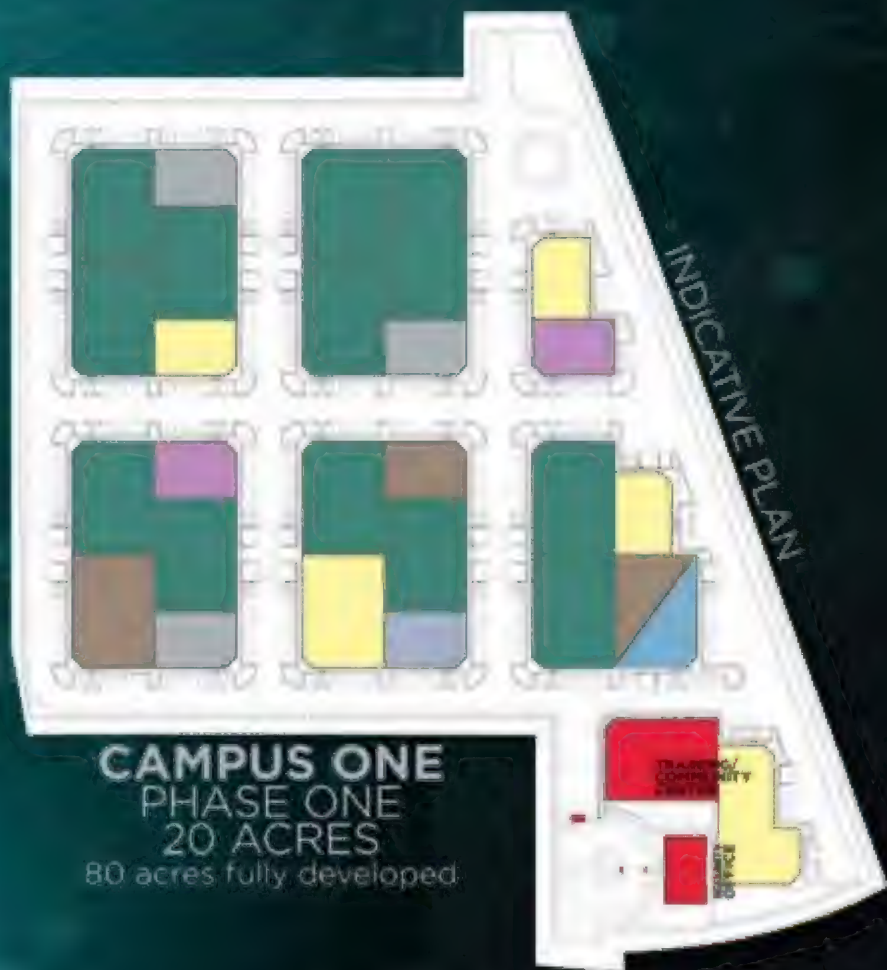




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One advantage of greenhouse growing: massive plants that yield between 6-8 pounds of ganja.

CONTROLLING YOUR ENVIRONMENT

Depending on the type of greenhouse you choose, the options available for controlling its interior grow environment can vary greatly. When we talk about controlling the environment inside a greenhouse, we are referring specifically to temperature, humidity and air-quality-control systems. A durable, stable greenhouse structure is needed to incorporate industrial-size equipment. Installing larger gear in smaller, less durable greenhouses may be difficult, and some ventilation tools, such as small intake fans, exhaust vents and vent flaps, have to be built directly into them.

Temperature is the most important aspect of environmental control in greenhouses simply because of the nature of the structures. Because greenhouses are specifically constructed to allow sunshine inside unobstructed, a byproduct of that is what is commonly known as the *greenhouse effect*. The greenhouse effect occurs when heat from sunlight is trapped in the greenhouse, which can be either a desired or unwelcome consequence, depending on the season and latitude at which the greenhouse is located (more on this to follow). While this can be a positive for your garden in the winter months, it can be difficult to deal with during the warmer seasons.

Today, modern greenhouse climate controls are fully automated, just like in indoor growrooms. Sensors monitor all environmental aspects and trigger the proper mechanical responses to help mitigate aspects of the atmosphere that are outside optimal levels. The difference between greenhouses and indoor gardens, however, is that a greenhouse will rely less on heavy equipment, such



A wet-wall evaporative cooling system and large heaters hang in this stand-alone greenhouse.

as HVAC units and built-in dehumidifiers, and more on structural components, such as motorized windows or vents, ventilation and circulation fans, cooling pads and misters, thermal shades, and built-in sprayers.

Of course, on the flip side, other greenhouses may be constructed to protect against colder climates. In these situations, a heating system within a greenhouse may be needed to supplement the heat collected from the sun. Simple greenhouse heating systems include hot water (or steam) for radiant heating of the interior. Other larger heating systems can also be deployed, such as commercial heating units, but these will add significantly to the energy costs of a greenhouse, especially because greenhouses are not well-insulated and can radiate heat loss in cold climates.



Pros & Cons of Greenhouses

Both the advantages and disadvantages associated with greenhouse cultivation increase with the size of the greenhouse. This is because the overhead related to correcting atmospheric conditions also increases with larger spaces. For home growers, this is less of an issue in terms of expenses, but the basic pitfalls still exist. Conversely, the savings on electricity also increase exponentially the larger the greenhouse is.

Smaller backyard greenhouses typically serve as space savers for cannabis growers, as utilizing space inside your home can be a bit harrowing. Rather, moving your garden outside—and utilizing the free power of the sun—is a double bonus. However, depending on where you live on the planet, the savings you garner in lighting may be starkly offset by the cost of power needed to keep ideal climate control within the greenhouse space.

As mentioned previously, the greenhouse effect within a garden can be a double-edged sword. On one hand, trapping heat in the greenhouse to increase garden temps during cold nights (or seasons) is actually one of the bigger selling points of a greenhouse, but on the other hand, it can be a major issue during hot days or summer months. These issues are magnified for those not living in moderate climates. The farther north or south you go, these issues may be exacerbated to the point that the costs associated with mitigating these environmental factors may be prohibitive.

Furthermore, while indoor growers will maintain the more ideal garden temperatures of 65-78°F, greenhouse growers need to gauge their temperature range based on what is happening outside in nature, since outdoor conditions easily affect the inside of non-insulated (glass, plastic, etc.) greenhouses (more on this below). However, achieving negative differential—a garden phenomenon whereby nighttime temps are kept a few degrees higher than daytime temps (which helps grow more compact plants with shorter internode lengths)—is easier in a greenhouse due to the greenhouse effect than it is in indoor gardens.

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GREENHOUSE TEMPERATURE & HUMIDITY

Because greenhouses are affected by seasonal changes in both temperature and the amount of sunlight, many greenhouse cultivators choose to keep their garden temperatures more in tune with what is going on outside. This helps keep the costs of maintaining a proper greenhouse climate much lower than if it were treated as an indoor garden with strictly enforced temperature thresholds. Therefore, temperature control of a greenhouse is different than just simply heating or cooling the space.

Ideally, daytime temperatures inside a greenhouse on a cloudy day are kept 5-10°F warmer than nighttime temperatures, while on clear, sunny days they are kept 8-15°F warmer. However, while warmer temperatures help raise the rate of photosynthesis and growth, these temperature increases must be done slowly and with care so as not to affect the growth rate or final product. Accelerating growth too quickly can result in uneven development, thin or stretched stems, smaller fruits and lower yields.

With this in mind, greenhouse temperatures still need to be maintained within certain ranges. For example, at temperatures over 86°F, the process of carbon extraction from CO₂ begins to significantly decrease, thereby slowing photosynthesis and the production of glucose (i.e., plant food). If the humidity gets too low or too high, stomata begin to close and plant respiration rates decrease, as does photosynthesis.

Humidity in the greenhouse is a delicate balance. While cannabis plants can easily handle levels of humidity of up to 70 percent, once humidity rises above that, mold, mildew and fungi start to develop very easily. This is particularly a concern in a greenhouse in which pathogens and spores are more easily transmitted indoors from the outside. This is why excellent air-filtration systems are needed in greenhouses for air-exchange systems. Expelling hot air out of the ridge (apex) and eaves (wall tops) by using ventilators is a typical solution, but these openings also allow outside air, with all its contaminants, inside as well. This is why it's a good idea to install air scrubbers (charcoal filters) inside the garden and at fresh-air-intake locations as well.



When the sun sets on flowering plants, supplemental lights turn on to keep a 12-12 light cycle.

SUPPLEMENTAL LIGHTING

One often-overlooked aspect of greenhouse growing is lighting. Many people assume that since the primary reason for using a greenhouse is to allow the use of natural sunlight, there is little to no need for artificial lighting. However, depending on where your greenhouse is located, geographically speaking, you will almost certainly need to utilize supplemental lighting.

Supplemental lighting is used in greenhouses primarily from the middle of fall to the early-spring season. Because light duration—or photoperiod—is an important and precise time-tracking mechanism for plants, even a small deviation in these schedules can mess up a cannabis plant's internal biorhythm, forcing it in or out of flowering and shocking the plant unnecessarily. Thus, even smaller backyard greenhouses will require the use of one or two HID (high-intensity discharge) lamps to keep plants both in their vegetative stage as well as their flowering stage later in their life cycle.

For the vegetative stage, cannabis plants require a photoperiod of 16-20 hours, depending on the strain and grower's preference for plant size and yield. When the sun's natural light cycle does not extend to the needed length, HID lamps are utilized to extend the photoperiod and keep the plants in veg. Similarly, in some parts of the United States (and around the world), the photoperiod required for flowering—which is really anything less than 12 hours, but still as much as possible up to that length—is too short and requires the use of supplemental lighting. However, in areas of the world where the sun's photoperiod constantly extends beyond 12 hours and growers wish to induce flowering in their plants, a different technique, called *light deprivation*, is utilized (more on this below).

Additionally, when dealing with young seedlings or clones, a more specialized lighting system may be needed in place of sunlight altogether. Young plants still developing root

systems need light that is softer and cooler in order to develop efficiently. Whether it be fluorescent lights for immature plants or lower-wattage HID lamps (150-250 watts), the need for supplemental lighting in these nursery-type situations is essential for strong growth and development of immature plants.



Many lamps are needed for supplemental lighting, adding to overhead costs.



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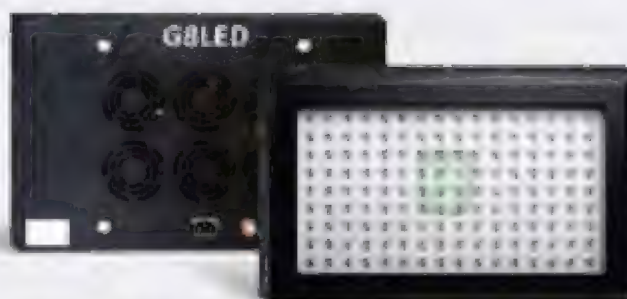
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TIMES

LIGHT-DEPRIVATION TECHNIQUES

Cannabis connoisseurs have heard the term *light-dep cannabis* when purchasing their marijuana and may have been confused when it was followed by “from a greenhouse.” The term *light dep* is actually an abbreviated form of *light deprivation*, a greenhouse cultivation technique that is the opposite of supplemental lighting. Whereas supplemental lighting adds light to extend the photoperiod, light deprivation blocks light to shorten the photoperiod.

Even more confusing is the fact that flowering cannabis plants need to have 12 hours or less of light to trigger—and to stay in—their flowering stage, which lasts roughly eight weeks. The confusing part is that while cannabis plants require the photoperiod to be less than 12 hours, they still need as much light as possible—up to that threshold—to maximize



Notice the tarps rolling out across the roof in this light dep greenhouse.

photosynthesis for energy production to produce bigger buds and heavier yields and potency. Thus, cannabis growers set their light cycle for 12 hours on and 12 hours off in a 24-hour period. In

greenhouses, this is easier said than done.

Because the grow cycle for a cannabis plant from start to finish is approximately two to three months (depending on the length of the vegetative

stage), growers can get four or even five cycles per calendar year. This means that a grow cycle in the middle of the summer in a greenhouse might have upward of 16 hours of sunlight per

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THE GAME HAS CHANGED

Article by Jeremy Deichen

Beautiful buds ready for harvest

Growing Exposed, a new video series produced by Jeremy Deichen, has been coined "the MTV Cribs of the marijuana industry" for its exclusive look into the once underground world of North America's gardens. Aside from revealing secrets of industry leaders, David Robinson, author of *The Growers' Handbook*, lends his expertise to a segment called *Teachings of the Garden Sage*. You can check out gardens, like the ones that make British Columbia's Kootenay region the Mecca of B.C. bud, on the latest episode at growingexposed.com.

When Bryan Johnston began growing cannabis, it was the early '90s. He was using 1000 watt bulbs hung from the ceiling commonly referred to as "Donkey Dick" lights. During this period, British Columbia was becoming infamous for the highest quality bud on the planet and people were calling the province's crops "Beaster". A lot has changed in the 25 years since — including his setup and the base plant food he uses, thanks to Green Planet Nutrients.

An environmentally conscious guy, Bryan says he remembers, back in the day running those 1000 kilowatt bare bulbs. Today, his indoor garden uses a smaller wattage but yields dramatically more per watt than ever before.

**"Everything has changed.
The game has changed,"**

he says. "I'm running doubled-ended P.L. lighting with four Spectrum King 600-watt LED lights and doing a massive cross spectrum of light, running four 315-watt P.L. ceramic metal halides. So I'm totaling just under 4,700 watts and yielding on average, two pounds or more for every 1,000 watts of light."

The most recent change to Bryan's garden wasn't in setup though, but to a new base plant food. Manufactured by Green Planet Nutrients, Dual Fuel is a highly concentrated, two-part formula that provides all the energy plants need without the need for calcium or magnesium additives. It's known for an easy application process which leaves less room for error.

"I've tried different brands but I've been using Green Planet's Hydro Fuel and got fantastic results, so when I went to my local grow shop and got some samples of Dual Fuel about two years ago, it wasn't a stretch to give it a try," Bryan says. "But on some level, any type of switch is a leap of faith as a grower. People who consume my product are used to a level of quality and I can't afford to give them anything less than the best."



Drying buds on the drying rack

Growing Lemon Haze since 2011, Bryan says this strain takes a little longer to flower than normal but the flavour and sativa experience is well worth it. He finds it easy to grow and the resulting product very consistent in quality. With the switch to Dual Fuel, Bryan says he noticed changes to his plants almost right away.

"The switch was really easy and the first noticeable difference was that my plants became way greener than before and they stayed lush green into the later stages of flower. It's also cleaner and I don't have salt residue or buildup. Plus I'm getting better and faster yields, so I'm saving about a week overall on my crop. I've done the math on what it costs to run other brands and not only am I saving money but I'm having better results."

With Dual Fuel, Bryan uses only three additives: Green Planet's Massive Bloom Formulation, Finisher, and Terpinator. He says when he's tested plants grown with the additives versus ones without, he's noticed way more cannabinoids.

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day. This is a problem for flowering plants that require no more than 12 hours of light. In this scenario, blackout cloth, screen or plastic is utilized to cover the entire greenhouse and block sunlight in order to adjust the photoperiod to the desired length. In small greenhouses such as cold frames or hoop houses, this can be done easily by hand. However, in large commercial greenhouses, these light-deprivation systems are fully automated and can be quite expensive to install.

Light deprivation is a meticulous technique and not easily implemented. Because of the highly sensitive nature of plants and their leaf-based signal systems for capturing light, light-deprivation systems must ensure that the greenhouse is completely sealed off from *any* light. Even the slightest bit of light hitting a plant can cause the plant



to go into shock and become a hermaphrodite, with the plant producing both female and male flowers (i.e., buds and seeds, respectively). Even worse, plants that do not receive light blocking for extended periods during the flowering stage may revert

back to their vegetative stage and stop flowering mid-cycle, ruining entire crops.

But while light-deprivation techniques are risky and often result in lower-quality cannabis, when done properly they can increase the number of harvests a

farmer gets in a year. And if no mistakes are made, light-deprivation greenhouses—in conjunction with smart organic practices and the full power of natural sunlight—can produce high-quality cannabis that is healthier than any other. 🌿

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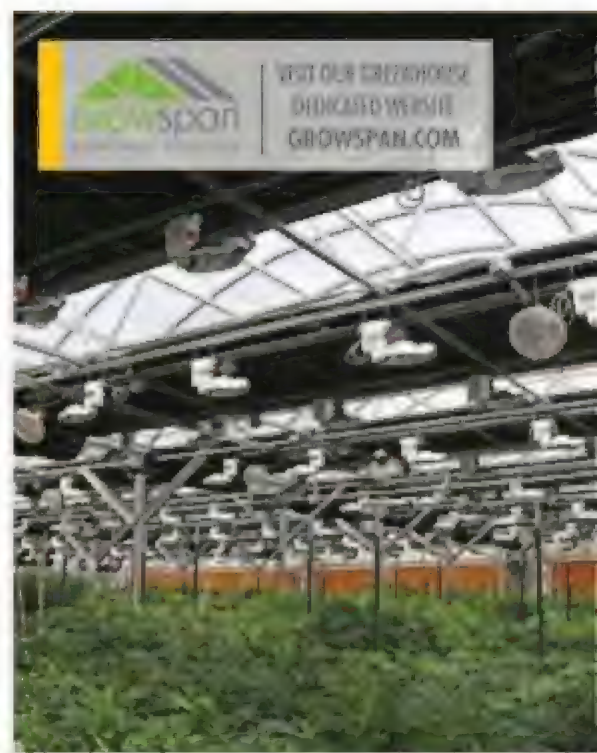
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Moms Who Get High

Despite widespread national support for cannabis, many mothers who medicate must deal with the social stigma.

By Jessica Delfino

When my son was born, it was through an incision in my abdomen. I was medicated with morphine and several other drugs, and I don't remember much of his birth. Three days later, I was given codeine and other medications to take at home and sent swiftly on my way. I felt uncertain about taking painkillers while breastfeeding, even though the doctors said it was okay. I used them for a couple days, but they made me feel so loopy that it was hard for me to remember if I'd fed the baby, they reduced my appetite so severely I became malnourished and dehydrated, and they made it difficult for me to connect with my infant son. When I held him, I could barely feel his weight, and I couldn't tell if I was being gentle enough with him because my sense of touch was altered. So I stopped taking

the codeine. After that, the physical pain of recovery from my surgery was more excruciating than I could have ever imagined. When the baby cried, sitting up was agonizing. Lifting him to my breast was literally gut-wrenching.

Then, a couple days later, the anxiety hit me: a hot tsunami of fear the likes of which I'd never experienced. Unrelenting feelings of terror—that there was something wrong with the baby, that he was going to die—plagued my every waking moment. I had endless irrational fears that would not be quelled, such as that my husband would die and I'd be left alone with the baby. I would imagine gruesome scenarios after gruesome scenarios, like my brain was a horror writer trying out new gore pitches on me. I checked myself into the emergency room, unable to stop sobbing or the intrusive,

cyclical thoughts. The doctor on duty told me that she'd had a baby a year earlier. She explained that things get easier. But for months the situation stayed the same. During this time, I felt utterly alone. I called my doctor and told her I thought I might have postpartum depression (PPD). She told me to hang in there.

At the insistence of my husband, I looked for a therapist experienced in postpartum depression. I couldn't find anybody nearby that my insurance covered, so I decided to just try to hang in there as I was told to do. I wished so badly I could smoke just a tiny bit of pot. I knew it would help, but "Moms don't smoke pot," I thought to myself more times than I can count. Why not? One reason—perhaps the most important, that every mom blog opined: "It's dangerous for babies."

At one of my son's checkups, I arrived in tears and asked his doctor to take my temperature. "Are you drinking two glasses of wine a night?" she asked me. My mouth dropped open. "I can do that?" She nodded and smiled. "Up to two a night," she confirmed. I didn't drink two glasses of wine a night before I got pregnant or became a mom, but I sure as hell was about to start.

Celia Behar, a high-energy woman with cascading dark curls, is one of the mothers supporting a new parenting and pot movement. Her popular blog *Lil' Mamas* discusses maternal matters in a candid way. Recently, Behar wrote about her own struggles with parenting and her choice to use cannabis recreationally, and also medicinally, to help cope with the traumas and hardships of being a divorced mother of two.

"I never really came back from the first round of postpartum depression," Behar explains. "I was accepting what I thought was motherhood. I found that before I started treating myself with cannabis, I was really short with my older daughter and I didn't really connect with her." Her daughter, Behar says, will occasionally suggest that her mom get high in times of stress. But for Behar, it's certainly not an everyday thing. "I tend to try to get through my day without using any cannabis," she says. Behar thinks it's normal to have a glass of wine around children while, say, cooking dinner—she just chooses to vape instead of drink.

Behar is a trained mental-health counselor, therapist and life coach who lives in a state where recreational and medicinal marijuana are legal. She admits to using a vape pen in front of her daughters, and sees this simple, smokeless act as an opening for her to have an honest discussion with her children about cannabis use.

Behar went public with her story after an in-depth discussion with her sister, who happens to be a Child Protective Services officer. "That's why most moms won't talk about using cannabis, because they're worried," Behar says. "CPS is going to open a case on you if you smoke pot while pregnant. It's still a Schedule I drug. It shouldn't be, but it is."

Zoloft and other mood-stabilizing drugs are often prescribed to help women cope with the pressures of motherhood. And mothers are often ushered with a wink and a nod into the "mommy wine club." Society approves if moms, within reason, drink their blues away. Since it's "just wine," and it's legal, it raises nary an eyebrow.



Society approves if moms, within reason, drink their blues away. Since it's "just wine," and it's legal, it raises nary an eyebrow.

"Before I started smoking again, I was drinking a lot—and I'm not a drinker, really," Behar says. "I needed a cocktail every night, and that's not who I am." That changed following a conversation with a childhood friend of hers, Tom Grubbs. Grubbs is a partner in Moto Perpetuo, an Oregon produce farm known for its brag-worthy heirloom tomatoes, as well as its incredible high-quality cannabis. Behar recalls: "We were talking and Tom said, 'You seem anxious and angry,' and I broke down and told him since I had kids I've had anxiety and I can't make it stop. He said, 'Do you still smoke pot?' I said, 'I'm a mom, moms don't smoke pot.' He said, 'Maybe you should think about that.'"

The discussion stuck with Behar, and she decided to give it a try. She struck up a relationship with the farm's owner, David Hoyle, his wife, Lori, and their family. Behar discovered she could trust Moto Perpetuo to supply her with organic, premium-quality cannabis to help treat her conditions. Her blog *Lil' Mamas* even publicly endorsed them.

Behar suffered, and cannabis helped, but many mothers didn't have any sympathy. They responded with a backlash of accusation, judgment and harsh criticism. However, for every negative response, there was a mom moved by Behar's story, wanting to know how to use cannabis to help cope with her maternal pain and trauma, too.

It's all too common for people to point

at other families and say that they're doing it all wrong. When the welfare of a child is clearly in danger, there is good reason for speaking out. Other times, it falls into a gray area. Is it okay to use cannabis if you have young children? The government now says yes, depending on where you live, just like it's acceptable to drink a glass of wine or beer if you have young children, even encouraged. But how about in front of your children? With cannabis legal in 30 states and counting and mothers admitting to using weed on social media—and the backlash that can follow—it is a new area of discussion.

Jill Trincherro and her husband started their edibles business *She Don't Know* in 2015. Together, the two—with help from Trincherro's mother-in-law—produce a line of THC-infused cookies and coconut snacks. They are parents to two teenage daughters, who Trincherro explains are thoroughly educated in cannabis: "Since they were small, any time we had the opportunity to teach them how marijuana is used as medicine, we took that opportunity, helping them understand that there's this plant that really helps people, and that it's not 100 percent legal. It's not OK for kids. Once you're of legal age, you can try it if you like, and don't ever feel like you have to, but it's an adult substance just like alcohol—so that's what we teach them."

Trincherro sees the benefits of using cannabis while parenting, though she won't use it in front of her children. "It has made me a better mother. There are times when I want to be a kind mother and I need to slow down and see what is most important, and sometimes cannabis can do that for me... You don't want the stresses of being a parent to affect your children in any negative way. I want them to see me [as] kind and patient."

A thoughtful, intelligent woman, Trincherro is less revealing about her personal reasons for consuming the plant medicinally, though she will admit that she uses cannabis to relax and manage anxiety. "My medical record is private; the medications we use are private." This touches on a common dilemma mothers and women who use medical marijuana face: They are often put into a position in which they feel they have to explain themselves and what their condition is, and then steel themselves for the judgment that will inevitably follow.

It might be easy to dismiss a mom who says cannabis helps with PPD or postpartum anxiety (PPA), if you're one of the lucky 85 percent of mothers who do

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not experience PPD or PPA, or a childless person, or a man. PPD/PPA is different than the “baby blues,” which up to 80 percent of new mothers experience—emotional postpartum feelings that fade on their own within a few weeks. PPD/PPA, as in my case, is a category-five-tornado version of the baby blues, featuring intense attacks of sorrow, fear, anxiety, withdrawal and, for some, an inability to function or extreme difficulty in doing everyday activities. It can also interfere with the ability of the mother and baby to bond. In rare cases, postpartum depression can result in obsessive-compulsive-disorder behaviors and even psychosis.

PPD/PPA affects women of all ages, backgrounds and levels of success, including celebrities like Kim Kardashian, Gwyneth Paltrow and Adele. The status of celeb moms who come out with their struggles brings more visibility to the challenges of motherhood. On the other hand, status and visibility can work to derail public understanding. Ann Coulter said pot makes users “retarded” in a rant at Politicon in July 2017. Around the same time, Portland mom Kayla Marlow posted an image of herself on her Facebook page smoking a bong while breastfeeding, which drew a massive backlash, even from some in the pot and parenting community.

Jenn Lauder and her husband run a pot and parenting lifestyle website, *Splimm*. A Wesleyan graduate and former school teacher, Lauder speaks intelligently on cannabis from a highly informed perspective. When the photo of Marlow went viral, Lauder was asked for her thoughts by a local news station covering the story. “I took a stand and said, ‘Maybe you shouldn’t be smoking anything next to an infant’s head,’” Lauder says. She laments that her “canna-momma” community felt like that comment meant she “sold them out,” but Lauder is holding fast.

“Responsible use matters, because of our kids’ safety and because of the optics of this movement,” Lauder explains. “I don’t think I’d hold a cup of hot coffee over my infant’s head. I was getting things like ‘Would you move your baby away from a campfire?’ and my answer was ‘Yes. I would. Absolutely.’” Lauder clarifies that the smoke and heat were her concern, not that the THC could be consumed by the baby through breast milk. “I made it absolutely clear that I have no issue consuming cannabis as a lactating mom. That’s not my issue at all.”

The popular mother’s information site

kellymom.com offers a treasure trove of topics on breastfeeding and other maternal concerns, including insight into the effects on babies of cannabis consumed through breast milk in a piece titled “Breastfeeding and Marijuana.” Some of the information is based on a 2001 medical-magazine report that THC makes its way into breast milk. The study, by the American Academy of Pediatrics Committee on Drugs, titled “The Transfer of Drugs and Other Chemicals Into Human Milk,” states that marijuana falls into the category of “Drugs of Abuse for Which Adverse Effects on the Infant During

I asked three pediatricians if I could consume cannabis while breastfeeding my son. None of them could answer with certainty.

Breastfeeding Have Been Reported.”

The study says that, as of 2001, there had only been one report in medical literature showing no effect on infants, but adds that marijuana has a very long half-life for some components, with an addendum: “The Committee on Drugs strongly believes that nursing mothers should not ingest drugs of abuse, because they are hazardous to the nursing infant and to the health of the mother.” Yet it offers no further details as to what those hazards might include. Psychotropic medications such as anti-anxiety, antidepressant and neuroleptic drugs were categorized as “Drugs for Which the Effect on Nursing Infants Is Unknown but May Be of Concern.” Both morphine and codeine were categorized as “Drugs That Have Been Associated With Significant Effects on Some Nursing Infants and Should Be Given to Nursing Mothers With Caution.” The report states that no effects were found with codeine and that morphine could possibly be found in measurable amounts in an infant’s blood. Suffice to say, my baby was probably born high on morphine. Though the report states there is no effect on infants, that wasn’t the way I would have liked my baby to have entered the world.

To further explore the effects of cannabis on babies from a medical standpoint, I asked three pediatricians if I could

consume cannabis while breastfeeding my son. None of them could answer with certainty—all admitted to lacking the knowledge necessary to offer a conclusive yea or nay. How are mothers supposed to be educated on the topic when even their doctors aren’t?

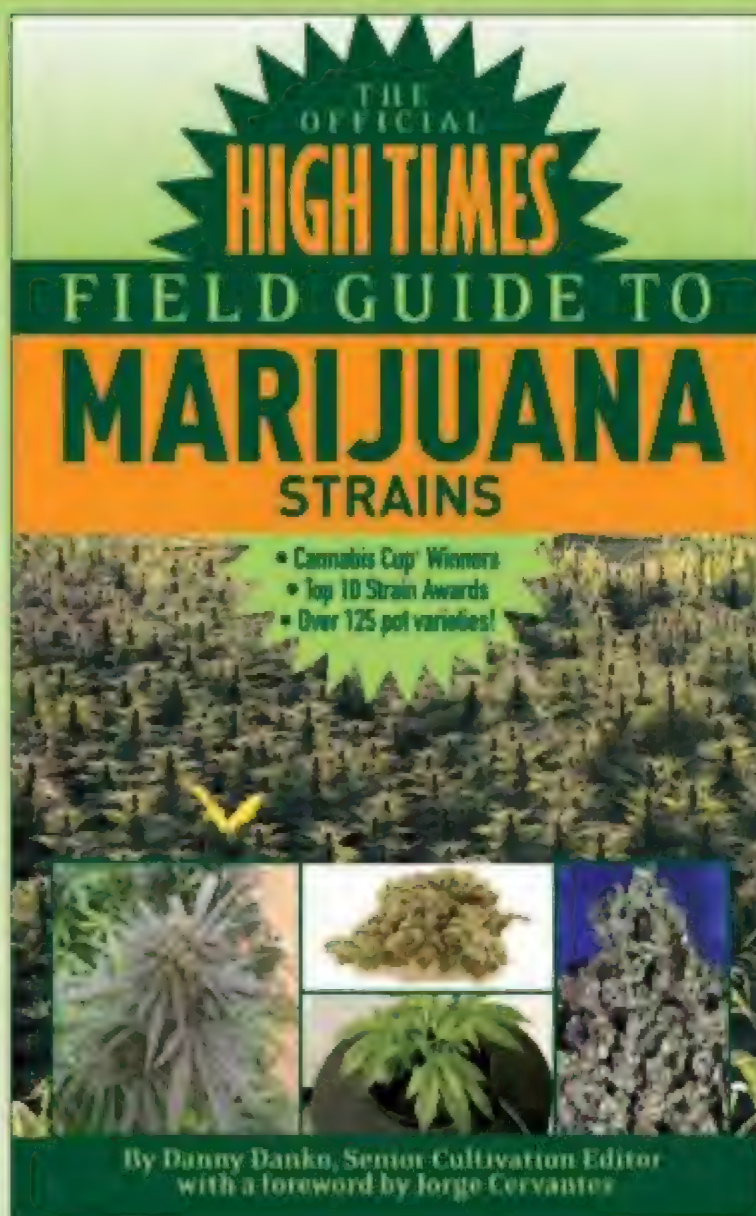
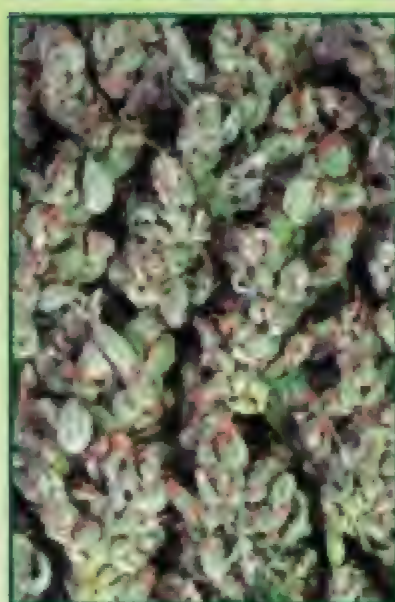
Many of the toys, play mats, carpeting, furniture, paints, bedding and clothing—even formula, food and the very water we drink in some cities—are toxic to our infants, our pets and ourselves. Items made in American and foreign factories are treated with carcinogenic chemicals and hazardous compounds that aren’t good for babies to put into their mouths, play with, breathe in or sleep on. Through a process known as “off-gassing,” these substances are released into the air and enter our homes, lungs and bodies. As a person who began smoking pot as a teenager and was raised in an environment where it was consumed with some regularity from as far back as I can remember, I can attest that, at least in my opinion, I turned out okay. I’m much more concerned with air and water quality, the toxic state of the world and the poisonous chemicals in our everyday household items than I am about a mom responsibly treating her PPD/PPA with cannabis.

What became clear to me from interviewing moms who use cannabis, reading studies, speaking to doctors, and contemplating the pros and cons of it myself is that the question shouldn’t be “Is consuming cannabis while breastfeeding and/or parenting acceptable, hazardous or questionable?” The question is “How can we get moms and parents the support, education and resources that they need so they can make the decisions necessary to be the best parents they can be?”

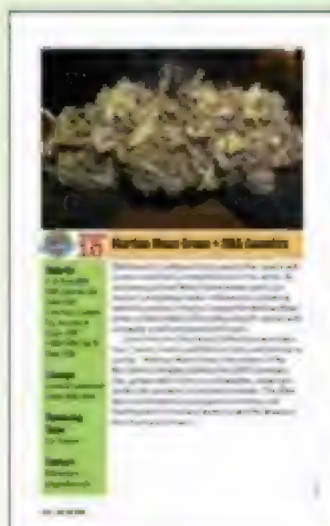
As cannabis becomes increasingly legal, now is the time for unbiased, well-funded studies on its effects on breastfeeding babies. Until that information becomes available, cautious mothers may opt to lessen anxiety with meditation, counseling, yoga, exercise, a healthy diet, laughter, finding time to do things they love—even if it’s only for five minutes a day—and the support of friends, family and loved ones.

Whether cannabis is smoked, vaped, eaten or otherwise consumed, I can attest that, as someone who has had a lot of experience with it over the years, as high as I’ve been (and that’s pretty damn high), there’s not any level of stoned or any strain of weed in existence that could keep me from loving and protecting my child. ✨

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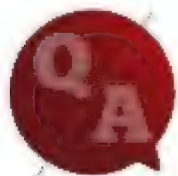
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By MIKE GIANAKOS

CAT CORA

THE HIGH TIMES INTERVIEW



CAT CORA GOT HER START ON THE FOOD NETWORK IN THE LATE 1990S AND SOON BECAME INTEGRAL TO THE COOKING SHOW TREND THAT WOULD DOMINATE THE NEXT DECADE. IN 2005, SHE MADE HISTORY AS THE FIRST FEMALE IRON CHEF. SINCE THEN, THE WORLD-RENOWNED CELEBRITY CHEF HAS OPENED RESTAURANTS AROUND THE GLOBE, RELEASED POPULAR COOKBOOKS AND A MEMOIR, AND APPEARED ON DOZENS OF SHOWS TEACHING PEOPLE HOW TO COOK AND LEAD HEALTHIER LIVES. CAT'S LATEST ENDEAVOR—ADVOCATING FOR MEDICAL CANNABIS PATIENTS—MIGHT JUST BE THE MOST IMPORTANT OF HER CAREER.

How did you get your start in the entertainment aspect of cooking?

Well, I was a partner in a restaurant in the Bay Area called Postino. It was a great success. I got a call to come do a local cooking show in San Francisco, and I'd never really done any television. Once I did it, I absolutely fell in love with it. I fell in love with being on television. This was the mid-'90s, so the celebrity-chef phenomenon wasn't quite there yet. The Food Network was just starting out, and this whole idea of cooking shows was still pretty new. I got the tape of that little local cooking show and I sent it in to Food Network, and they called me, like probably a couple weeks later, and wanted me to come in and do a guest appearance on a show. Then they called me back to do a couple more shows and it all happened super-fast. So the planets were all aligned and I was ready to go because I'd found this new medium that really excited me, and I had some aptitude for it. So I jumped on it. In 1999, I got my first show with Food Network called *Melting Pot*, with Rocco DiSpirito. That's really how it started.

You were the first female Iron Chef. What challenges do you face in a male-dominated field?

When I went to culinary school, it was pretty bad still. It was pretty rough. I had instructors tell me I should go back to Mississippi and be barefoot and pregnant and stay in the kitchen at home, you know?

So it's [better] these days, but it's still not completely equal, like many industries, for men and women. For me, the challenge was really to just go in and be fierce, you know? You have to. When I came into this industry, it was still the wild, wild West. You had chefs turning grills over that were lit, with food on it and with fire in it. They'd

Cat Cora is lending her voice to the medical marijuana movement.



"THERE IS A PLACE FOR PLANT MEDICINE AND CANNABIS IN OUR WORLD."

turn the whole thing over because they were pissed about something, or people threw pots and pans because you did something they didn't like. It's just a lot of sexual harassment, innuendos, things like that. It was a really rough time for women when I started in the industry.

The challenge is really being able to go in there and slay, put your head down, cook hard and let that speak for itself. Sometimes it did. Sometimes it didn't, and you'd have to leave. You've got to go somewhere more open-minded, and that's what I did. I got a lot of offers early on

because I graduated top of my class at culinary school, went to France and cooked for two three-star Michelin chefs when women were not welcome in kitchens in France. I got really lucky that there were two three-star Michelin chefs that were open-minded enough to let me cook there. Back then, it literally was very few kitchens that would take females. And they would tell you straight to your face, "We don't take females here. You're not allowed in our kitchen."

When I moved to California and went out and embarked on my own, the challenges are

that at that time when [restaurant owners] offered me \$7 an hour, they were probably paying the guys \$9 an hour or \$10 an hour. So it's pay equality in kitchens. It's promotions, equal promotions for equal work. Equal pay for equal work. The same arguments we hear every day in almost every industry. It's the same struggle.

It's something the cannabis industry is struggling with too.

Right, exactly.

You place a heavy emphasis on healthy lifestyles. How does cannabis fit in with health and wellness in your mind?

Well, look, I saw my dad wither away to nothing. He was a big Greek guy, a giant teddy bear, and he withered away to skin and bones. It broke my heart. I see my mom struggling with her ovarian cancer, going through chemo for five years, and finally stopping chemo because it was counterproductive. So, for me, [cannabis] should be legal everywhere. The way that I see it, it should have a place in everybody's life that wants alternative medicine for pain, for trauma, for PTSD, if you have cancer and you have no appetite. You need to eat to feed your body, to feed your soul, so that you can live longer, fight the cancer better.

It's really part of health and wellness. I think that being strong in your mind, body and soul is so important to health and wellness. There is a place for plant medicine and cannabis in our world. You shouldn't have to live with pain. You shouldn't have to live with not being able to enjoy a simple meal. You shouldn't have to live with trauma and night terrors and nightmares and everything that people with PTSD struggle with daily. So, for me, that's part of being healthy. That's part of overall wellness, and those things are helped by cannabis. In my mind, that's where it plays a giant role.

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Have you seen cannabis help someone who's suffered through an illness?

Yeah, I've seen people who have definitely benefited. Melissa Etheridge, who is a dear friend of mine, she had breast cancer. The way that she got through breast cancer and chemo was through using cannabis. She's been cancer-free for over a decade now and, yeah, I've had powerful experiences seeing it absolutely work for people.

What do you think of the current legalization trend in the country?

I think for me, my biggest call to action, is really based in the medical field, because I believe that it lends credibility. I think if we can legalize [cannabis] medically for everybody, we can legalize it in general—then I truly believe that it gives it a ton of credibility. You have doctors backing it who are world-renowned doctors who deal with all kinds of medical issues who are backing the legalization of cannabis, and many, many other people who are

very influential. So I think if every state would legalize for medical use, the other will follow. [Recreational] pot will follow, because people will see that there is a use for it, it does have credibility—and look, if somebody wants to partake recreationally in a safe and responsible way, like people do with alcohol, so be their choice.

We've made incredible strides in the last few years, but many people are still waiting for legal access to marijuana...

My mother's a perfect example of this. She has ovarian cancer and she's like, "Look, when it becomes legal in Mississippi, yeah, I'll try it. But until it's legal, I don't want to," you know what I mean? Even if I had a medical card, even if she comes and visits. It's important for people, especially the older generations, to purchase something for their health that's legal. Because to them, that makes it credible.

So, for me, it's really about going out and spreading the word that this should



be legal. You need people in this industry who are extremely credible in areas that are useful to people. So someone like myself, I've been doing this for 25 years. I believe I bring a lot of credibility to the table. People cooking my recipes, buying my cookbooks, buying products, things like that... Super-important. Whether it's me as a chef, whether it's a doctor, a renowned doctor coming forward and saying, "Absolutely I believe 100 percent in medical marijuana and using cannabis for medical purposes," and so on. The credibility has to be there, and the doors will open for everything else. If not, Middle America will not buy into it, and it will stay in the black market.

Are you concerned at all with the Trump administration affecting the state-level cannabis laws that are currently in place?

I'm scared of that administration for every reason [laughs]. I think that... You know what? I'm really on the fence. I don't know. It's a really tough one. It's

hard to understand where this administration is. I mean, Obama came out and said absolutely, medical marijuana should be legalized. You knew exactly where he stood on this. You have no idea where Donald Trump's going to stand on Monday compared to where he's going to stand on Friday.

So it's a tough question. It's going to be interesting to see what the administration does. I can tell you he's going to have a lot of pressure from the pharmaceutical companies because, obviously, if medical marijuana becomes legal, they're going to take a hit. So it's going to be really interesting.

You worked a bit with the previous administration, right?

We did a lot for Michelle Obama. When the Obama administration was in the White House, Chefs for Humanity helped launch two of her big initiatives, the Let's Move campaign for kids to get up and be active and families to be active, and also the Chefs Move to Schools [campaign], which was about helping create better meals and healthier meals for kids in public schools.

Tell us about Chefs for Humanity.

I founded Chefs for Humanity back when a tsunami hit Asia, so it's about 12 years ago. I did that because there really was no organization that provided emergency-feeding relief. No culinary organization, I should say. There are many incredible organizations that we partner with, but there was no culinary entity that addressed emergency-feeding relief during a crisis. That was something really important to me.

You find in a crisis there's one of two things that happen. You either have no food or you have a ton of food. In Hurricane Katrina, there were a lot of casinos that got blown away, a lot of restaurants that shut down. There was so much food that was going to go bad, so we put it in refrigerator trucks. We had so much food, and for people who aren't used to dealing with tons of food and inventory, you have a chance of food-borne illness breaking out. Then everybody gets sick and it's a disaster. It's two disasters in one. So it's important to have culinary professionals handling the food.

When I flew to Haiti and helped after the earthquake hit, there was zero food. We had kids who were eating mud cakes and dry mud because there was no food. So you have the other side of

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the pendulum you have to deal with. You have to ration beans and rice out, things like that. So I felt it was important to have a culinary organization that was responding in emergency-feeding relief.

You've opened restaurants all around the world. Any plans for a Cat Cora cannabis-themed place on the horizon?

Anything's possible! I think that could be really cool.

Do you have a dish that you think works particularly well with marijuana?

I have so many different recipes that I know for a fact would work really well with cannabis. Cannabis is a plant, you know, so really I look at it as another herb. There's so many different parts of the plant that you can use for different things. So I think that it works in both savory and sweet dishes because it's like you're putting another herb in. That's how I look at cooking with cannabis—it's another herb that's amazing and adds such incredible flavor and aroma to sweet and savory dishes.

With all the medical and recreational laws that have been enacted and the regulations

"FOR ME, IT'S REALLY ABOUT GOING OUT AND SPREADING THE WORD THAT THIS SHOULD BE LEGAL."

that have followed, we've seen the edibles market make huge strides in both the quality of cannabis food and also the packaging and labeling. What do you think about the current edibles market?

I definitely think it's so much better. A lot of [packaging], years back, would be handmade, and I think it's been taken to another level that's safer for sure, and definitely more professional, commercial. That's always a good thing, a good sign.

You're an internationally recognized brand with mainstream partnerships. Did you have any concerns about coming out in favor of medical marijuana?

I didn't. You always have to check in with anything that you're doing that's cutting-edge, right? You have to check in and make sure that you can fully embrace it, that you're looking at all the pros and cons. That's just a sign

of a good businessperson in general. I think we did that. Nicole [Ehrlich] and I, being business partners, and life partners, we talked it over many, many times, and for us, it's really about the medical space first and foremost, because we have such incredible stories of our families and friends who've gone through cancer or gone through illnesses or been in so much pain and struggle that I think it was a no-brainer for us to say, "Okay, this could be tricky for some of our partners and a little too edgy, but we're going to take a chance because we think that it's also something that can help save lives and help create a lot of comfort for people who are in a lot of pain." It's just really, really something that we believe in. ✱

See Cat's recipe for a medicated Basque Beef Tenderloin on page 118!

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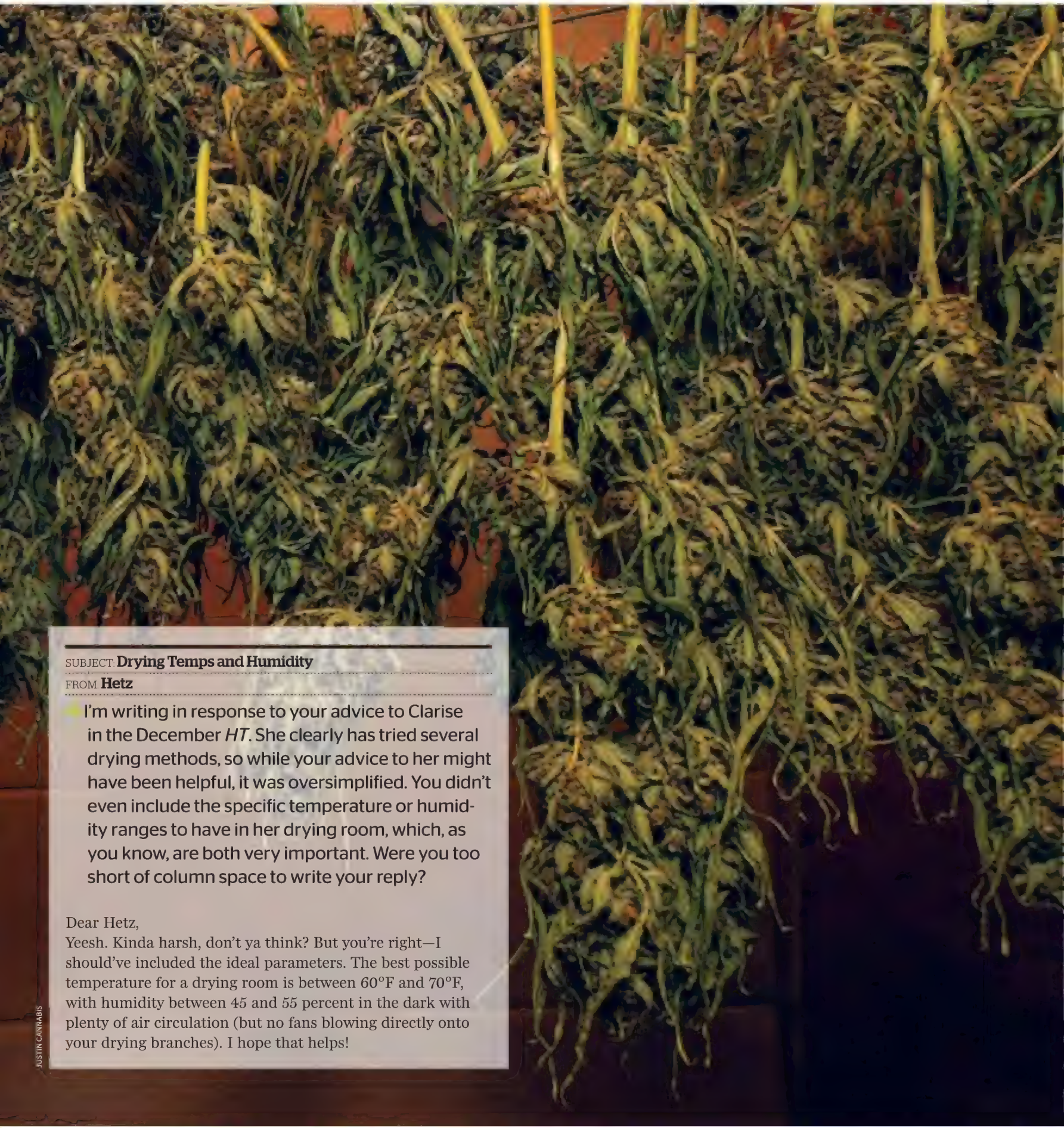
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Auto-flowering light schedules, selective pruning, yellow leaves, drying temperature/humidity and more...



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SUBJECT **Drying Temps and Humidity**

FROM **Hetz**

I'm writing in response to your advice to Clarise in the December *HT*. She clearly has tried several drying methods, so while your advice to her might have been helpful, it was oversimplified. You didn't even include the specific temperature or humidity ranges to have in her drying room, which, as you know, are both very important. Were you too short of column space to write your reply?

Dear Hetz,
Yeesh. Kinda harsh, don't ya think? But you're right—I should've included the ideal parameters. The best possible temperature for a drying room is between 60°F and 70°F, with humidity between 45 and 55 percent in the dark with plenty of air circulation (but no fans blowing directly onto your drying branches). I hope that helps!

Danko Tip: Watering outdoor plants in the morning and evening saves water that would otherwise evaporate at midday.

Auto-flowering
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SUBJECT: **Auto-Flowering Light Schedule**
FROM: **Andrew C.**

🌱 I'm starting some auto-flowering plants and I'd like to know if I need to change the light cycle to 12 hours on/12 hours off or keep the cycle the same throughout?

Dear Andrew,
You do not need to change the light cycle when growing auto-flowering strains. The best light schedule you can use is 18 hours on/6 hours off throughout the entire life cycle of the plant from seedling to harvest. The plant will flower regardless of photoperiod when it reaches a certain height predetermined in its genes.

SUBJECT: **Selective Pruning**
FROM: **Scott M.**

🌱 My outdoor plant is flowering. Should I prune the fan leaves around the buds to expose them to more sunlight or just leave them alone?

Dear Scott,
I don't usually recommend pruning healthy leaves from a flowering plant. There are exceptions, however—for example, when leaves are quite low on the plant or certain large fan leaves block light from reaching flowering tops. You must remember that the fan leaves are the “factories” that take in light and convert it into plant energy

and, thus, new growth. Removing too many fan leaves reduces the growth process significantly.

Some very selective pruning can help reveal growing tips to the light and increase yield. I prefer to tuck fan leaves under the growing tips instead of removing them altogether.

On particularly large plants, removing lower growth and fan leaves that are well below the canopy can improve air-flow and reduce the likelihood of powdery mildew (PM) and mold. Any yellow, dying or dead leaves should be removed and discarded immediately.

SUBJECT: **Two Seeds, One Pot**
FROM: **Eric S.**

🌱 Hi, this is my first attempt at growing. I got some auto-flower seeds, and I decided to germinate two of them. They are both from the same strain (Trainwreck). One seed germinated much more quickly. In two and a half days, the tap root was about half an inch. The other seed was still the same, no tap root, so I left it in the wet paper towel to see if it was just taking longer to germinate (I was told the seeds will take 2 to 7 days to germinate). I potted the one seed that germinated already, and it's starting to sprout from the soil after a couple of days. Note that I'm growing indoors.

At that point, the seed that hadn't germinated was still a husk by day 5. I figured at this point, if it were to germinate, I'd start seeing something emerge from the seed, but there was nothing. So I decided to germinate a third seed. After soaking it for 14 hours, I'm now ready to transfer it to a wet paper towel to continue the germinating process. As I was about to toss the seed that wasn't germinating, I looked at it and noticed that it's starting to grow a tap root. It's small, but more than what I've seen in the last few days.

From the looks of the second seed, I'm thinking it's probably a slow grower. And if the third seed sends out roots like the first, I wager the second and third seeds will be ready to plant at the same time. So now my dilemma is this: I don't want to toss the second seed, and I'm germinating the third. I only have one 3-gallon pot left, and no more room in which to store the plants. Can I, or should I, chance planting both seeds (assuming the third will germinate



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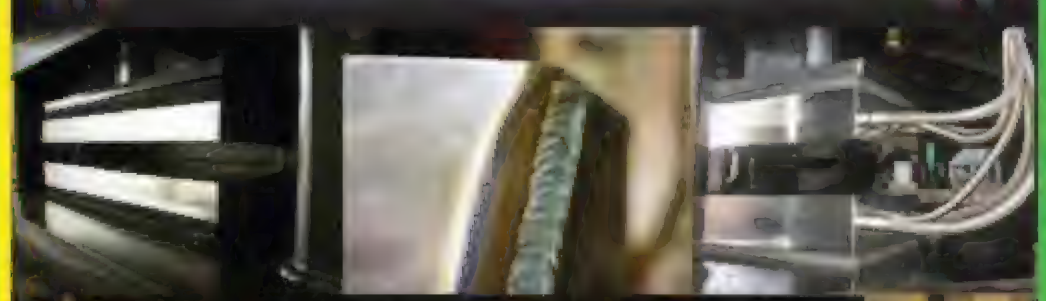
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okay and the second will finally grow a decent tap root at the same time) in the same 3-gallon pot?

I've read that a 3-gallon pot is actually more than enough for one seed and that the roots will never fill the pot up, especially from auto-flowering plants. If I plant two seeds in one 3-gallon pot (even if the roots do tangle), will they start "fighting" for space if they're both from the same strain? And will the 3-gallon pot be big enough for the roots of both plants? (If I need to stunt one or both plants a bit, I'd be fine with that.)

I just want to know if growing two plants in one pot will damage one or both of them to the point of them not being usable at all. Like I said, it's my first grow attempt, and I don't mind both plants in the one pot not yielding as much as possible—as long as there's some yield. I'm hoping that even if one plant doesn't yield as much as it should by growing in a pot of its own, two plants will still yield more than the one.

Dear Eric,

It's perfectly all right to grow more than one cannabis plant in one pot, especially auto-flowering plants with a limited life cycle. You're correct that it may diminish your yield, as the roots will compete for nutrients and the plants will compete for light, but there's no danger of them "fighting" or hurting each other in the process. No damage will occur to the plants from sharing one pot. There's a slight risk that if one develops a systemic disease the other may get it, but that remote possibility shouldn't stop you from growing them out.

SUBJECT: Yellow Leaves

FROM: Michael M.

I've been growing for a couple of years now, but I'm having trouble this year with my leaves yellowing. I always start my plants indoors and then sex them before moving them outside. Everything was going as expected until about a week ago, when my leaves started turning yellow and dying. My light cycle is 18/6 and I'm using compact fluorescents. What should I do? I thought I might be watering too much or too little. Do I need more light? Should I apply lime? Please help!

Dear Michael,

There are several possibilities as to why your leaves are turning yellow. You must investigate all of them in order to determine which one is affecting your plants and how to deal with it and remedy the situation. First and foremost, your plants must receive enough light. If your compact fluorescents are too far from your plant canopy, lower the lights or raise the plants.

The next thing you should do is check the pH of the medium in which you're growing your plants. If it's below 5.5 or over 7.5, this is the cause of your yellowing, as any nutrients you're adding cannot be absorbed by the roots in overly alkaline or highly acidic conditions. If this is the case, adjust the pH of your medium using lime to help neutralize it or acidic material such as cottonseed meal if it's too alkaline. You can also purchase concentrated pH Up or Down.

If pH isn't the problem, perhaps your plants are suffering from a severe nitrogen deficiency? Add some nutrient solution rich in nitrogen to your medium. Did the new growth "green up" and

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Danko Tip: Never exceed 85°F or drop below 60°F in your growroom and maintain relative humidity (RH) between 40% and 50%.

flourish, or is the yellowing persisting?

Watering too little will make plants look droopy and is easily remedied by adding water. Watering too much will make them curl down and yellow. If your medium is always wet, this could be the culprit. Hopefully you have diagnosed your problem from among these options. The important thing is to find the right remedy for your issue and not to misread it and compound the problem with more of the same.



SUBJECT: **Flushing Time**
FROM: **Doreen**

Hello. My question is about flushing my plants. Most articles say to flush the plants for a week or two, but it's unclear as to how many times I should flush them during the week. Is it every day, or three times a week, or what? I'm very confused about the whole process.

Dear Doreen,

Your plants should go through a wet and dry cycle, even during the flushing process. Flush your plants with plain pH-balanced water only as frequently as you would water with a nutrient solution. So when you determine that your plants need water, that's the time to flush.

Depending on your growing method, medium and container, this could be every day or every few days. Be sure to let it flow until water is draining from the bottom of your buckets (if growing in a soilless mix). Hydro growers should replace the nutrient solution in their reservoirs with plain water. 🌿

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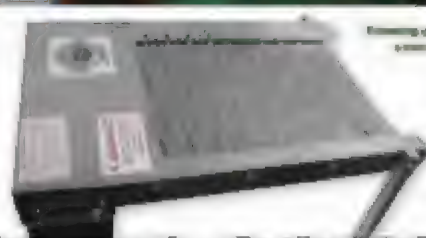
The High Times Cultivation Department is constantly on the lookout for new innovations in marijuana-growing technology. Each year, we reveal the latest and greatest grow gear as part of our Significant Technological Achievements in Secretive Horticulture (or S.T.A.S.H.) Awards.



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Sadly, intrusive searches have become a way of life these days, so we're always looking for new ways to protect our pre-rolls from prying hands and eyes. We love the new **Stash Shades** from Hyd & Co that provide a stylish and discreet way to hide a couple of joints or some dollar bills where most privacy violators wouldn't think of looking for them.

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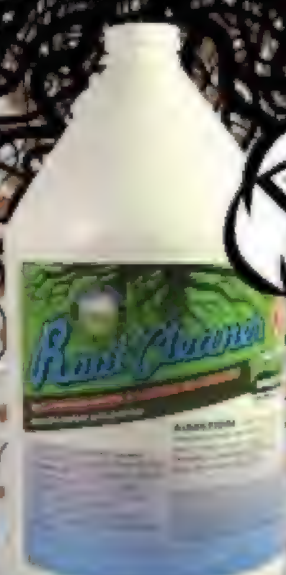
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Edibles



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BASQUE BEEF TENDERLOIN WITH CHIMICHURRI SAUCE

THIS MONTH'S FEATURE-INTERVIEW SUBJECT, CELEBRITY CHEF CAT CORA, CONTRIBUTED ONE OF HER EASY-TO-MAKE RECIPES FOR A HEALTHY AND DELICIOUS MEDICATED DISH.

This recipe is beneficial for many reasons. The beef tenderloin, which can be substituted for a less expensive cut like a NY strip or a flank/hanger steak, is lean and full of iron, and it's a whole protein.

The chimichurri sauce, which can be created without the chilies, has a lot of green herbs and chlorophyll, which are good for heart health, circulation and digestion, and other important antioxidants and nutrients. You can also serve this dish with orzo, an excellent carb that's needed for calories but also soft on your stomach and easy to digest.

Cannabis can be incorporated into the orzo or the chimichurri sauce with THC-infused olive oil. Leaf or bud can even be added into the steak rub. For this recipe, *High Times* recommends using cannaoil with the chimichurri sauce, which can be portioned out to suit your desired effect.

INGREDIENTS

1 whole beef tenderloin (3½ to 5 lbs.)
1 tbsp. dried orange peel
1½ tsp. chili powder
1 tsp. sea salt
1 tbsp. olive oil
6 garlic cloves
3 dried bay leaves
1 poblano chili (coarsely chopped, with seeds)
1 serrano chili (coarsely chopped, with seeds)
1½ tsp. sea salt
½ cup fresh flat-leaf parsley (finely chopped)
¼ cup fresh oregano (finely chopped)
¼ cup fresh basil (finely chopped)
¼ cup sherry vinegar
¼ cup cannaoil

DIRECTIONS

Rub the tenderloin with kosher salt and pepper to taste, then rub with the orange peel,

chili powder and sea salt. Let sit for 30 minutes.

Preheat the grill or, if pan-searing, preheat the oven to 450°F.

To grill: Place the meat on the hot grill and sear on all sides until caramelized. Close the hood of the grill and cook, turning occasionally, for 20 to 25 minutes, until an instant-read thermometer registers 125°F for medium-rare.

To pan-sear: Pour the olive oil into a large skillet over high heat. Sear the beef on all sides, about four minutes per side, until it is brown and caramelized. Place the beef on a rack in a roasting pan and roast for 30 to 40 minutes, or until an instant-read thermometer registers 125°F for medium-rare. Remove from the oven and let the beef rest for 20 minutes.

Place the garlic, bay leaves, chilies and salt in a mortar and mash with a pestle to a smooth paste. (If you don't have a mortar and pestle, put all the ingredients in a blender with just a teaspoon or so of the vinegar and puree.) Transfer to a medium-size bowl and add the parsley, oregano and basil. Whisk in the vinegar and cannaoil until well combined.

Slice the beef into quarter-inch-thick slices and serve with orzo and the chimichurri sauce. ✱



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Edibles



GANJA MASALA CHICKEN WINGS

THESE TASTY MORSELS WILL SPICE UP YOUR NEXT PARTY! BY CHEF GABRIEL REEVES.

A terpy twist on a regular sweet'n'spicy sauce, this extra-flavorful, super-easy chicken-wing recipe was handed down from my mom and has been a tried-and-true family favorite for decades. As the wings roast, the warm buttery aroma of chicken fat fills the kitchen, followed by the bouquet of spices wafting from the garam masala as the sauce caramelizes in the oven.

Accentuate the complex flavors from the garam masala by garnishing the finished wings with a variety of fresh herbs including basil, cilantro, parsley or tarragon, and add depth of texture by topping them with toasted sesame seeds or crushed nuts like cashews, peanuts, or macadamia or Brazil nuts. Make sure to buy plenty of wings, since they always disappear quickly!

You can buy a garam masala spice blend, or you can easily make your own by combining 1 tablespoon of cumin with 1½ teaspoons each of coriander, cardamom and black pepper; 1 teaspoon of cinnamon; and a ½ teaspoon each of cloves and nutmeg. Add a ½ gram of kief if you're feeling adventurous!

INGREDIENTS

5 lbs. chicken wings, separated at joints, tips discarded
Salt to taste
2 tbsp. minced garlic
1 tbsp. garam masala
½ cup apple-cider vinegar
½ cup cannabis-infused honey
½ cup ketchup
½ tbsp. cannabutter, melted (optional)
½ cup chopped parsley for garnish
½ cup toasted sesame seeds

DIRECTIONS


Preheat oven to 400°F. Season wings with salt. Line two 10" x 15" x 1" baking pans with heavy-duty foil. Divide the chicken wings between the two pans.

Bake, stirring gently every 10 minutes, for 35-40 minutes, or until golden-brown.

While the chicken wings are baking, combine garlic, garam masala, vinegar, medicated honey, ketchup and optional cannabutter in bowl; stir to blend well.

Pour the sauce over the chicken wings, dividing it evenly between the two pans. Turn the chicken to coat the pieces evenly. Return the chicken wings to the oven and bake for 25-30 minutes longer, or until the edges of the wings are lightly browned. Transfer the wings to a platter and garnish with chopped herbs and toasted sesame seeds. Serves six to eight. ✨

Chef Gabriel Reeves is an experienced edibles educator, expert dispensary manager and cannabis purchaser who's always on the hunt for the best terps around! Follow Gabe on Instagram at @gabrielcooksfood.

A full-body photograph of Paul McCartney. He is wearing a black fedora-style hat, a black t-shirt with a white graphic, and black pants. He is sitting on a white wooden stool, leaning back with his hands on his hips. He is pointing his right index finger towards the graphic on his t-shirt. The background is a plain, light-colored wall.

Many years ago, I was fishing,
and as I was reeling in the poor fish,
I realized, "I am killing him—all for
the passing pleasure it brings me."
And something inside me clicked.
I realized as I watched him fight
for breath, that his life was as
important to him as mine is to me.

I AM PAUL McCARTNEY, AND I AM A

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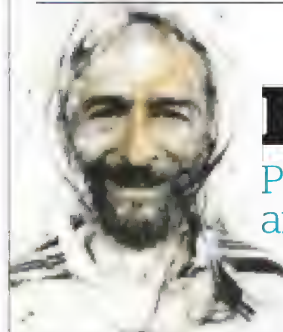
We are proud to welcome Jeffrey Warsh to establish a new cannabis industry practice group. Jeff is an alcoholic beverage and cannabis law attorney and registered governmental affairs agent with over 30 years of experience in highly regulated industries. Our practice group advises entrepreneurs in the complex and evolving field of cannabis law, providing guidance and insight into entity formation and capital raising, real estate and zoning, permitting and regulatory compliance, and enforcement and transactions related to the licensing of alcoholic beverages and cannabis.

Contact us to learn more:

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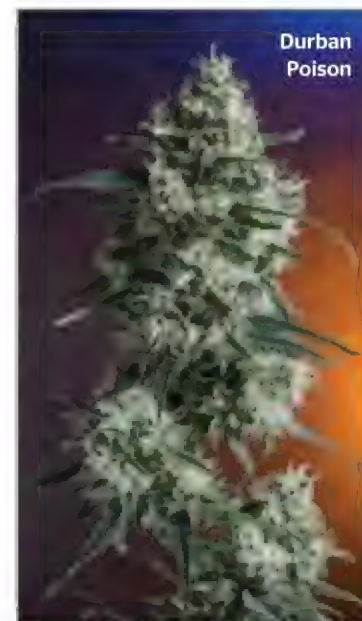
Peppy pot, intelligence, fentanyl and dependency.

Got a question for Dr. Mitch? Email him at 420research@gmail.com.

You've mentioned some sedating terpenes but I NEED to perk up.

Rip Van Winkle

Hey Rip,
Eucalyptol and pinene look potentially stimulating in the aromatherapy literature. The high-THCV strain Durban Poison, the legendary Chocolope and the CBD-rich Harlequin all contain these and have rousing reputations. Make sure you're getting plenty of rest and a bit of regular exercise, too.



My husband is screaming about fentanyl-laced weed. Is this a thing?

Henpecked Henrietta

Howdy Henrietta,
No. Fentanyl costs about a dollar a microgram (a millionth of a gram) on the street. Even the priciest cannabis doesn't go for a million bucks a gram. It's just bad business. Why put something extra-expensive in with your plant material? A faulty news report about people who tested positive for opiates and THC got misquoted and requoted, leading to all the confusion.

My sister says new British studies show cannabis doesn't decrease IQ, but she's really dumb. Is it true?

Alberta Einstein

Hi Einstein,
Researchers showed that 18-year-olds who were cannabis-dependent DID have lower IQs, but they had lower IQs at age 12, before they'd even

gotten into the plant. Cannabis doesn't make people dumb, but some dumb people use cannabis. It's best to wait until your brain's developed before messing with marijuana, unless you need it medicinally.

I think that folks who use marijuana and only marijuana are not going to run into problems. It's mixing it with hard drugs that makes things a mess.

Tom No Mix

Yo TNM,
The data is on your side! Recent work shows that only 2 percent of folks who use cannabis and only cannabis have cannabis dependence (if you believe in that), but 20 percent of those who use cannabis with other drugs have it. I can't help but wonder if the plant is getting blamed for symptoms it didn't cause! 🌿

Dr. Mitch Earleywine, PhD, is the author of Understanding Marijuana and The Parents' Guide to Marijuana.

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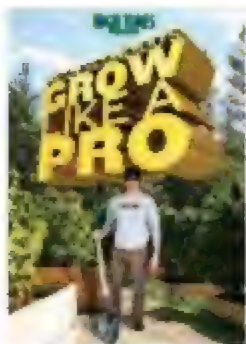
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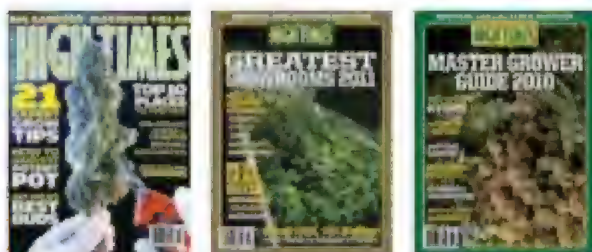
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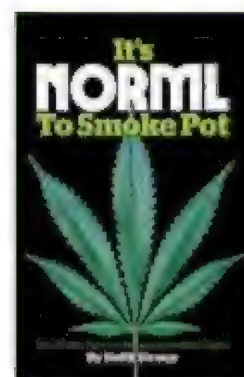
The Official HIGH TIMES Field Guide to Marijuana Strains
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Legal Cannabis Is Improving Public Health

Cannabis has a significant positive impact on some of America's deadliest bad habits.

Paul Armentano is deputy director of NORML. Visit norml.org.

Legal cannabis access is associated with numerous favorable public-health outcomes. Here are just a few of them.

FEWER OPIOID DEATHS

Changes in the legal status of cannabis is associated with significant reductions in opioid-related mortality. Data published in 2014 in *JAMA Internal Medicine* show that medical-cannabis regulation is associated with year-over-year declines in overall opioid-related mortality, including heroin-overdose deaths. Specifically, medicalized states experienced a 20 percent decrease in opioid-related deaths as compared with non-medicalized states within one year. This decrease climbed to 33 percent by year six. Other studies have separately linked the establishment of both dispensaries and adult-use retailers with reductions in opioid-related deaths. The number of traffic fatalities involving opioid-positive drivers has also fallen in states that have implemented medical-marijuana laws.

LESS ALCOHOL USE

Market research indicates that many adults are choosing legal pot over booze. For example, 2017 survey data from self-identified cannabis consumers in California indicate that one-third of millennials have switched from beer to marijuana.

Twenty percent of Gen Xers and 8 percent of boomers similarly acknowledged substituting weed in place of booze. A 2016 market analysis by the Cowan & Company research firm similarly determined that beer sales by major distributors—such as Anheuser-Busch and MillerCoors—have “collectively underperformed” in Colorado, Oregon and Washington in the years immediately following adult-use legalization.

Some medical-cannabis patients also report curbing their alcohol intake. A 2017 study published in the *Journal of Psychopharmacology* reported that 42 percent of medical-marijuana patients surveyed reported reducing their alcohol consumption following admission into their state's medicinal-cannabis program. This reported shift from booze to pot may be linked with increased traffic safety. According to a 2016 study in the *American Journal of Public Health*, the enactment of medical-cannabis laws “are associated with reductions in traffic fatalities, particularly pronounced among those aged 25 to 44 years.”

Researchers attributed this decline to fewer people driving under the influence of alcohol.

FEWER DRUG-TREATMENT ADMISSIONS

The opening of medical-cannabis dispensaries is correlated with an immediate

decrease in narcotic-related admissions to drug-treatment facilities. That is the finding of a just-published research paper by a University of Georgia economics professor which concludes, “dispensary openings experience a 20 percentage point relative decrease in painkiller treatment admissions over the first two years of dispensary operations.” A 2016 Castlight Health study of over one million subjects similarly reported medical-cannabis access was associated with a far lower prevalence of opioid abuse and doctor-shopping.

LESS OBESITY

Changes in marijuana's legal status are associated with an annual reduction in obesity-related medical costs. Writing in 2015 in the journal *Health Economics*, San Diego State University researchers reported, “[T]he enforcement of MMLs (medical marijuana laws) is associated with a 2% to 6% decline in the probability of obesity... Our estimates suggest that MMLs induce a \$58 to \$115 per-person annual reduction in obesity-related medical costs.” Separate studies comparing subjects with a history of cannabis use versus controls consistently report that consumers are less likely to be obese or to suffer from diabetes, and are at a decreased risk of being diagnosed with a metabolic syndrome. 🌿

FREEDOM FIGHTER

Philly Strong

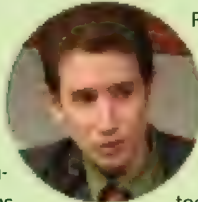
Derek Rosenzweig offers a reminder: It's NORML to smoke pot.

For more than a decade, Derek Rosenzweig has been a very familiar face within Pennsylvania's marijuana movement. After his dad was diagnosed with reflex sympathetic dystrophy, Rosenzweig quickly recognized that medical marijuana would be particularly beneficial for his condition. After this realization, he started attending Philly NORML meetings and engaging his

representatives as often as he could in order to change marijuana laws in his state and finally provide his dad with the relief he needed.

“I'd been a cannabis consumer only for a few months at that point, but after some conversations with people about the Drug War, I learned about the lies and propaganda, and decided the only way things would change is if I worked to change them,” said Rosenzweig. So that's what he decided to do.

After a few meetings,



Rosenzweig found himself serving on Philly NORML's board of directors. From his start as co-chairman to most recently serving as the organization's technology director, he worked tirelessly to educate his community and elected officials across Pennsylvania. Throughout his tenure, Rosenzweig helped organize local meetings, fund-raisers and rallies; lobbied elected officials in support of decrim, medical and legalization efforts; and significantly expanded the reach and brand of Philly

NORML and cannabis-legalization efforts throughout Pennsylvania.

“Besides my dad's illness, I'm just another cannabis consumer who wants to be able to rip a bong without fear of the cops. I want to legally grow my own or buy some hash from a local head shop, and for people like my dad to be able to do the same but with added safety/quality since they need it for medical purposes,” added Rosenzweig. “It's really not all that much to ask. If Pennsylvania had a ballot-initiative process, that's where we'd be right now.”

By Kevin Mahmalji, NORML national outreach coordinator

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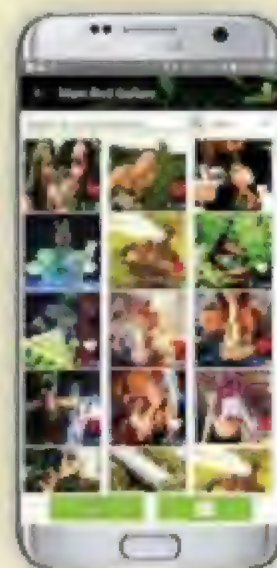
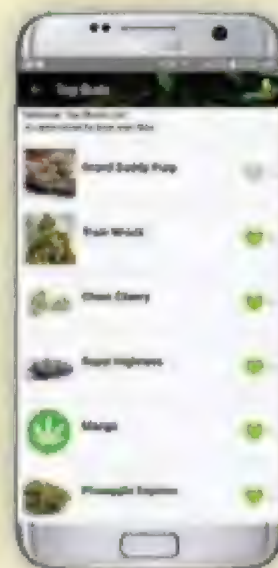
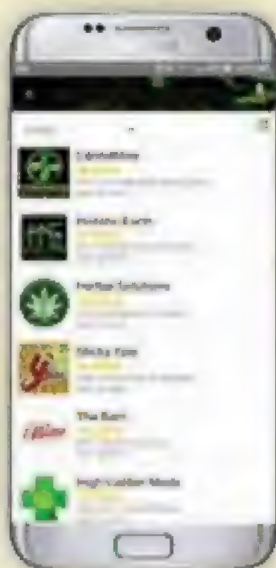
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NEW REGULATIONS BOOST ACCESS TO MEDICAL CANNABIS GLOBALLY

Over the past few years, medical cannabis investors have focused mainly on opportunities in the United States and Canada. Both countries have strong capital markets for raising money and large patient bases with legal access. But companies from Canada and the United States are beginning to look farther from home as medical cannabis globalizes.

Continued from a previous issue with a focus on Cannabis Globalization

In 2014, the Canadian government modernized the country's medical cannabis laws. This process saw a tightening of regulations around the production and sale of cannabis, but streamlined the business side and did away with much of the grey areas in the industry.

New companies were issued production licenses from the federal government and allowed to sell directly to eligible patients across the country.

What followed was a boom in cannabis production companies, known as Licensed Producers or LPs. Without access to traditional funding, these companies raise capital through public offerings on stock markets in Canada. Many of the largest cannabis companies today are examples, like *Canopy Growth Corp.* (TSE:WEED) or *Aurora Cannabis* (TSE:ACB).

In the United States, there is a patchwork of regulations that vary from state to state. But 29 states

currently offer legal cannabis to eligible patients. This number has grown exponentially in the last few years, with major markets like California, New York, Illinois, and recently Florida.

Many of the major companies operating in the United States have chosen to focus on medical cannabis technology, since there is no single federal regulation for production.

To expand markets and access to capital, market leaders like *Alternate Health* (CSE:AHG; OTC:AHGIF) have built cross-border companies, integrating the advantages of both markets in Canada and the United States.

Building on their success, American and Canadian medical cannabis companies are expanding into overseas markets.

In Europe, many countries have had some form of access to cannabis for decades, but there are no multinational regulations or market yet. A few countries only allow access to cannabis derivatives, while others only allow restricted access to dried, whole-flower cannabis.

Currently two companies dominate the market, the U.K.-based *GW Pharmaceuticals* (NASDAQ:GWPH) and the Netherlands-based *Bedrocan*. However, favorable changes in legislation recently have opened a huge new medical cannabis market in Germany. American and Canadian companies have been quick to strike deals with German distributors, and one suspects much more investment is on the horizon.

Recently, investors have turned their sights on Latin America as well. In the past few years large steps have been made to legalize medical cannabis in the three largest Spanish-speaking economies in the region: Argentina, Colombia and Mexico.

The regulations in each country are currently under development, but North American companies have already begun making investments.

Colombia in particular has seen investment from abroad take off. Canadian-Colombian partnership *PharmaCielo* has begun operations in Medellin, Colombia, while the U.S.-based *New Colombia Resources* (OTC:NEWC) have also launched a subsidiary, *Sannabis*, in the country. Mexico has only legalized medical cannabis this year, but should also see significant investment in the coming months.

What started as a collection of upstart companies in the United States and Canada is now growing into an integrated, global industry. Medical cannabis offers companies excellent opportunities to apply technology and expertise learned at home to new markets overseas. This will lead to both an improvement in patient health across the globe, and profits for companies at home.

DEMAND FOR CONTINUING MEDICAL EDUCATION TO INCREASE

Nick Swan is an avid investor and advocate for Medical Cannabis Industries

As regulation changes in the United States and around the world, the number of medicinal cannabis patients is exploding. People are finally able to exercise their right to access marijuana to alleviate their symptoms and treat illnesses. But as the patient base expands, can the number of well informed doctors keep up with this increase?

Part of the issue with cannabis has been a lack of understanding. An informational gap exists largely due to the simple fact that it has been wrongfully stigmatized for years. Pharmaceutical companies spend billions of dollars soliciting doctors to prescribe their medications and have for decades, resulting in a lack of incentive for medical cannabis education.

Whenever a gap exists, there are those who step up to fill it. Continuing Medical Education (CME) courses, are available to physicians covering the science of cannabis— including the plant's medical applications, and how it is best prescribed.

CME courses are educational platforms for medical professionals to ensure that regulated knowledge is maintained and distributed. Physicians can learn about developing areas in their respective fields and apply this knowledge to improve patient health in their own practices. It is often mandatory for physicians to study a number of CMEs as many countries require continued education to maintain their licenses to practice medicine.

Within the U.S., CME for physicians is regulated by the *Accreditation Council for Continuing Medical Education (ACCME)* and the *American Osteopathic Association (AOA)*. CME courses focused on medical cannabis and its applications are now available. *Alternate Health (OTC:AHGF CSE:AHG)* offers online courses for physicians and other medical personnel, where credits are earned after testing. These CME programs are approved by accredited universities for the purpose of understanding the endocannabinoid system and the benefits of cannabis as medicine.

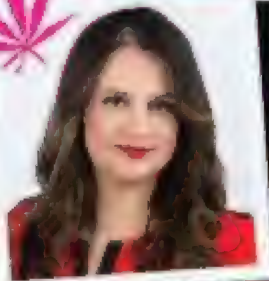
The Society of Cannabis Clinicians and TMCI Global also offer online medical cannabis courses intended for clinicians.

Convenient and approved CME courses are becoming available to physicians just as medical cannabis begins to be legalized across the globe. Companies engaged in CME courses are raising the bar for the future and solidifying their reputation in the medical community. Since CMEs feature world-class curriculums developed by medical experts, they can compete with any existing course in other fields.

There is incentive for physicians to further their study in order to maintain their medical licence. Skeptical doctors now have a vehicle to navigate the scientific and biological facts that Cannabis research has uncovered. This should both help doctors administer better care, while benefitting companies who are invested in medical cannabis.

For more information about CME Courses visit Alternatedhealth.ca

Women In Cannabis



Kristina Neoushoff
• • CEO at Women Grow

With over 15 years of experience — including a stint at Apple, where she learned branding, efficiency and innovation — Kristina studied and taught business to enable female entrepreneurs to reach their full potential. Women Grow connects, educates, and empowers women in all segments of the cannabis industry.

• • *Describe how the cannabis industry has evolved over the years?*

I've seen a massive shift in the call for inclusion and diversity, as well as encouraging businesses from other industries to pivot into cannabis.

I believe the people who have been in this space longest are recognising that they are setting the tone for future Leaders, and their example needs to be a good one.

Individuals are speaking out against bad practices, and holding one another accountable to do better. Some may still say it's

the Wild West, but we're working to do better.

• • *When do you think the number of women in cannabis is really increasing?*

Women have unique qualities that benefit them being in the space - ability to plan for the unknown, organise a community, provide education and knowledge, plus a host of other skills.

Women should dive into this field so that they can help build the space to their ideal.

It's only by taking action and contributing that we'll be able to impact change - so get involved!

• • *What do you think the future holds for the cannabis industry?*

Things are so early and variable right now, it's imperative that we all work together to build the best, brightest, and most inclusive space imaginable.

If we learn from the mistakes of other industries, we can leap forward to accomplish great things - creating jobs, furthering education, providing medical care, and aiding communities by increasing revenue.

We can do all of this, as long as we support one another and focus on including representation

from all communities and backgrounds.

• • *How do you plan business about the Cannabis industry?*

Women Grow is setting a new standard for how businesses can profit from purpose, by partnering with diverse, inclusive, compliant organisations and individuals.

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Connect with Kristina at womengrow.com



Pot Shots

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FLOWER OF THE MONTH



LEAVES OF GRASS

I've been taking photos of my garden every two weeks to see the progress. This one was early on but I fell in love with it. I hope you guys like it as well! Dee Machado
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GROW OF THE MONTH**HEMP RISING**

Luce Farm in Stockbridge, Vermont is a diverse organic production farm focused on creating quality hemp products with an emphasis on high-strain CBD. Luce Farm is proud to be part of the sustainable agricultural revolution - the hemp revolution! And also to be one of many great legacy Vermont family farms. The strain is BaOx. lucefarmvt.com Chris Lillie

**CLOSE UP OF THE MONTH****FUNKY FLOWER**

I took this photo of a Pineapple cross with my cell phone and a jeweler's loop. Jen

**GROWER OF THE MONTH****FREEDOM FARMER**

I live in Battleground, Washington. The weather was dry this summer and gave us a nice long grow season. I thought I would share a picture of one of my plants. It's amazing when you just get that little bit extra in the season. Chris Ressler

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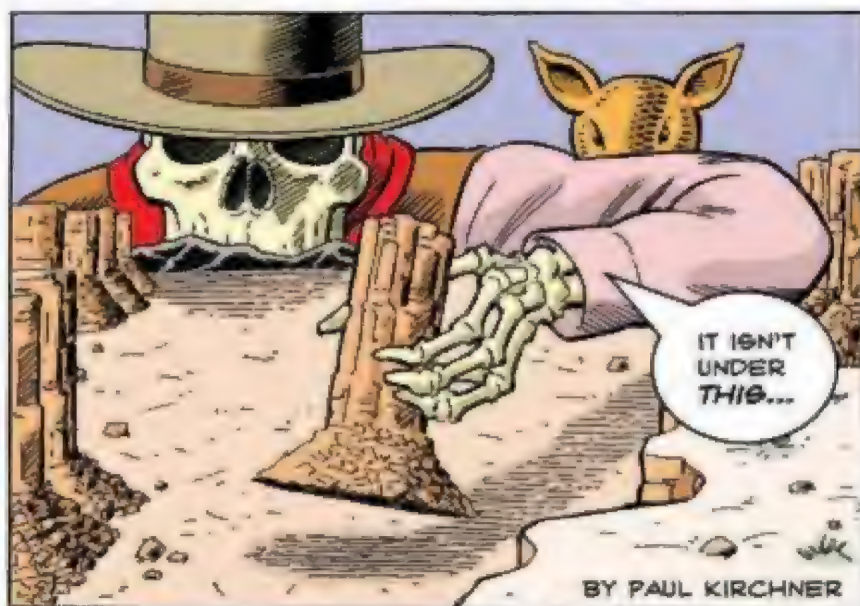
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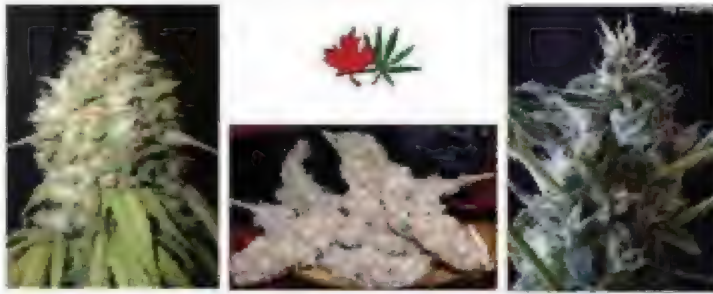
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MARIJUANA BY THE NUMBERS

We're breaking down all the available data—user trends, arrest figures, tax revenue—to provide a state of the union for cannabis.

VERTICAL GROWING

Efficiency of garden space can double your yields and make you more money. That's why there is a growing trend towards the vertical cultivation of cannabis and why many new growers are utilizing all spare space—from floor to ceiling. Nico Escondido examines the advantages that vertical gardens present as well as some tips on how to set-up the best vertical grow systems.

SOCAL CANNABIS CUP

High Times heads back to one of our favorite Cannabis Cup locations, the NOS Events Center in San Bernardino, CA, to host the country's premier pot party. Find out who took home awards for the best pot, hash, edibles and topicals at the SoCal Cup!



MEDICAL MARIJUANA DIRECTORY

FREE WEED

FROM DANNY DANKO



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Growing your own marijuana can be both a liberating and political act. In this pot-cast, *High Times* Senior Cultivation Editor and author Danny Danko provides news, activism reports and cannabis cultivation tips for connoisseurs, aficionados and medical patients alike.

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Interviews with expert growers and professional seed breeders. 'Strain of the Week' and ganja frowing questions & answers.



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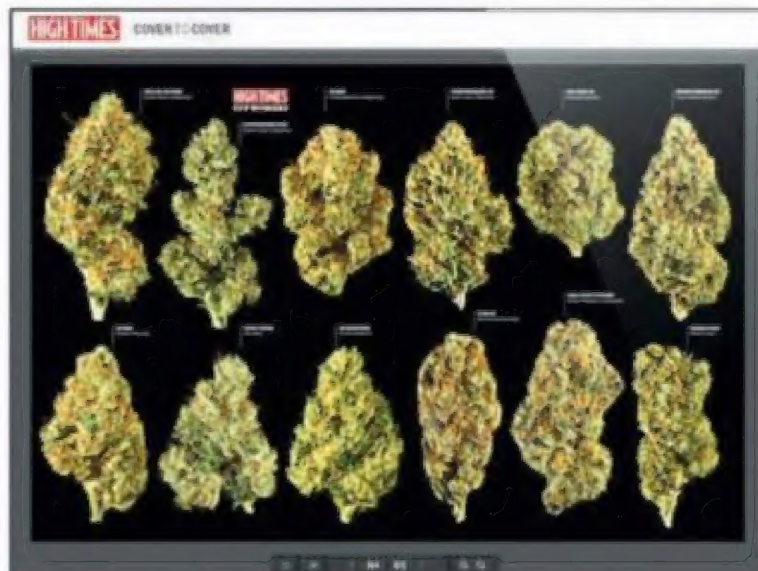
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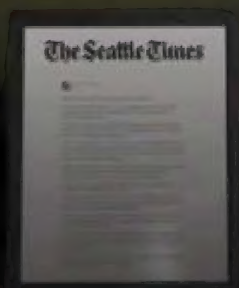


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